

A facile design, highly efficient green synthetic strategy of peony flower-like $\text{SO}_4^{2-}\text{SnO}_2$ -fly ash nano catalyst for the three component synthesis of serendipity product with dimedone in water

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Table S1

EDS elemental composition, atomic and weight percentage of SnO₂-fly ash, SO₄²⁻SnO₂-fly ash and sixth run SO₄²⁻SnO₂-fly ash.

SnO ₂ -fly ash			SO ₄ ²⁻ SnO ₂ -fly ash			Sixth run SO ₄ ²⁻ SnO ₂ -fly ash		
Element	Weight %	Atomic%	Element	Weight %	Atomic%	Element	Weight %	Atomic%
O K	43.88	71.81	O K	49.15	62.70	O K	46.29	60.82
Na K	0.78	0.89	Na K	11.48	10.19	Na K	8.39	7.67
Mg K	1.51	1.63	Mg K	0.51	0.43	Mg K	2.53	2.19
Al K	7.12	6.90	Al K	15.55	11.76	Al K	5.15	4.01
Si K	8.02	7.48	Si K	18.94	13.76	Si K	28.80	21.56
Cl K	0.48	0.36	S K	0.27	0.17	Cl K	0.22	0.13
Ca K	4.59	3.00	Ca K	0.71	0.36	K K	0.48	0.26
Fe K	2.54	1.19	Fe K	0.86	0.31	Ca K	4.68	2.45
Sn L	29.90	6.60	Sn L	0.63	0.11	Fe K	1.53	0.58
Au M	1.18	0.16	Au M	1.89	0.20	Sn L	1.95	0.34
Totals	100.00		Totals	100.00		Totals	100.00	

UV-Vis DRS

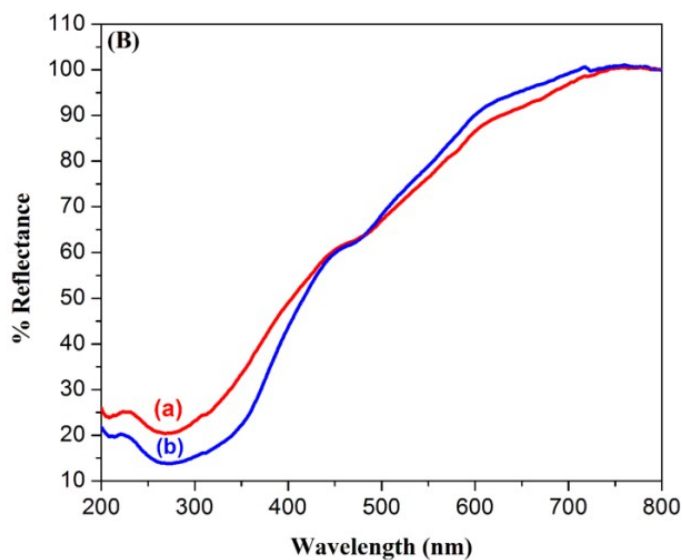
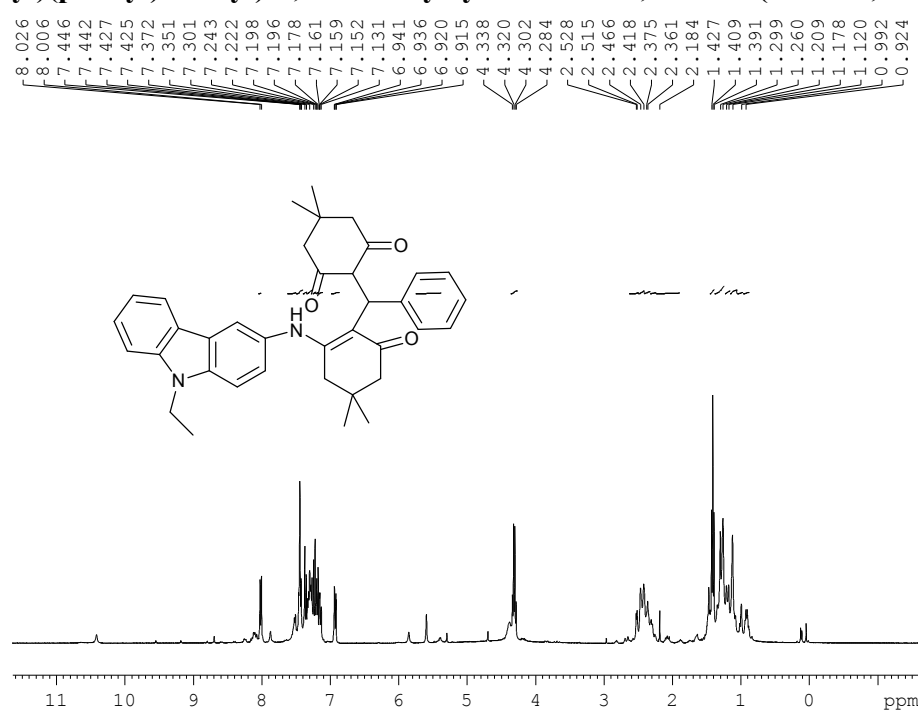


Fig.S1 UV-Vis Reflectance spectra of (a) SnO₂-fly ash (b) SO₄²⁻SnO₂-fly ash.

2-((2-((9-ethyl-9H-carbazol-3-yl)amino)-4,4-dimethyl-6-oxocyclohex-1-en-1-yl)(phenyl)methyl)-5,5-dimethylcyclohexane-1,3-dione (Table 2, entry 1, 4a)

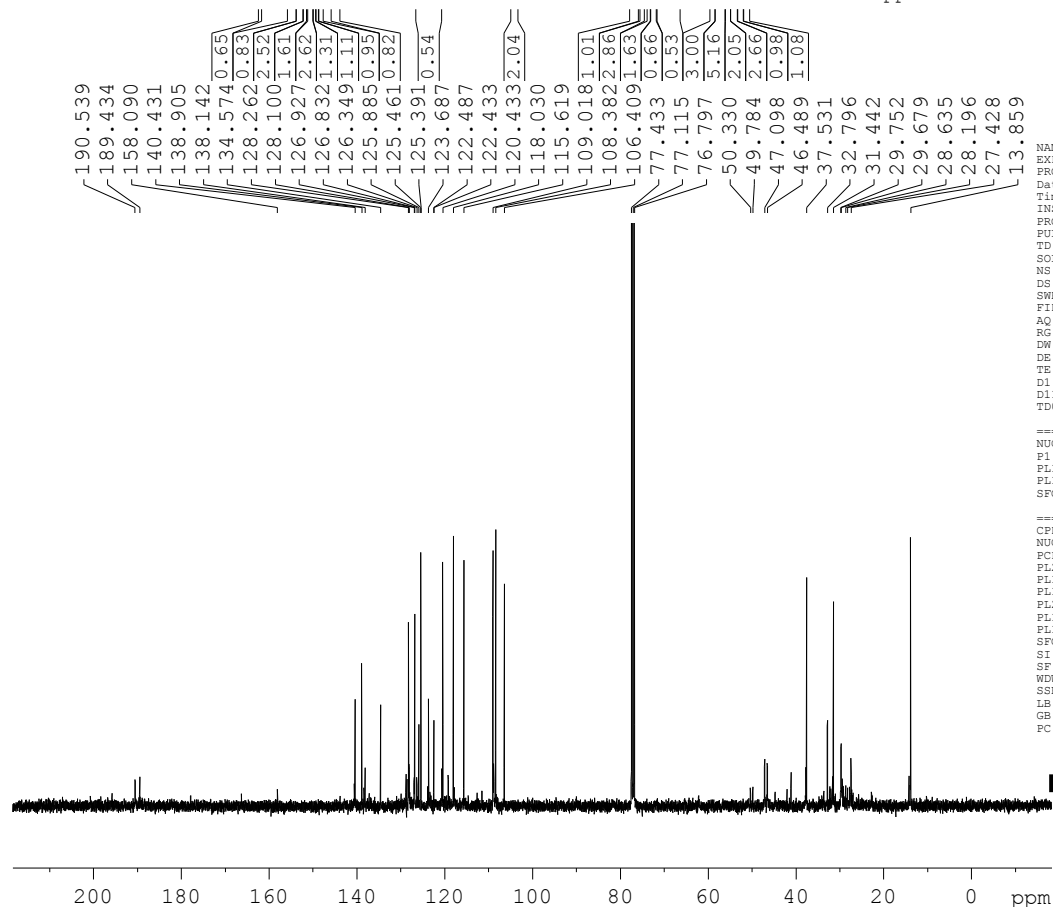


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PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8012.820 Hz
FIDRES	0.122266 Hz
AQ	4.0894966 sec
RG	28.5
DW	62.400 usec
DE	6.00 usec
TE	298.0 K
D1	1.00000000 sec
TD0	1

===== CHANNEL f1 =====

NUC1	1H
P1	10.00 usec
PL1	0.00 dB
SFO1	400.1318754 MHz
SI	32768
SF	400.1300069 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



TM-dh2

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PROCNO	1
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PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	851
DS	4
SWH	24038.461 Hz
FIDRES	0.366798 Hz
AQ	1.3631988 sec
RG	28.5
DW	20.800 usec
DE	6.50 usec
TE	300.0 K
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D11	0.03000000 sec
TD0	1

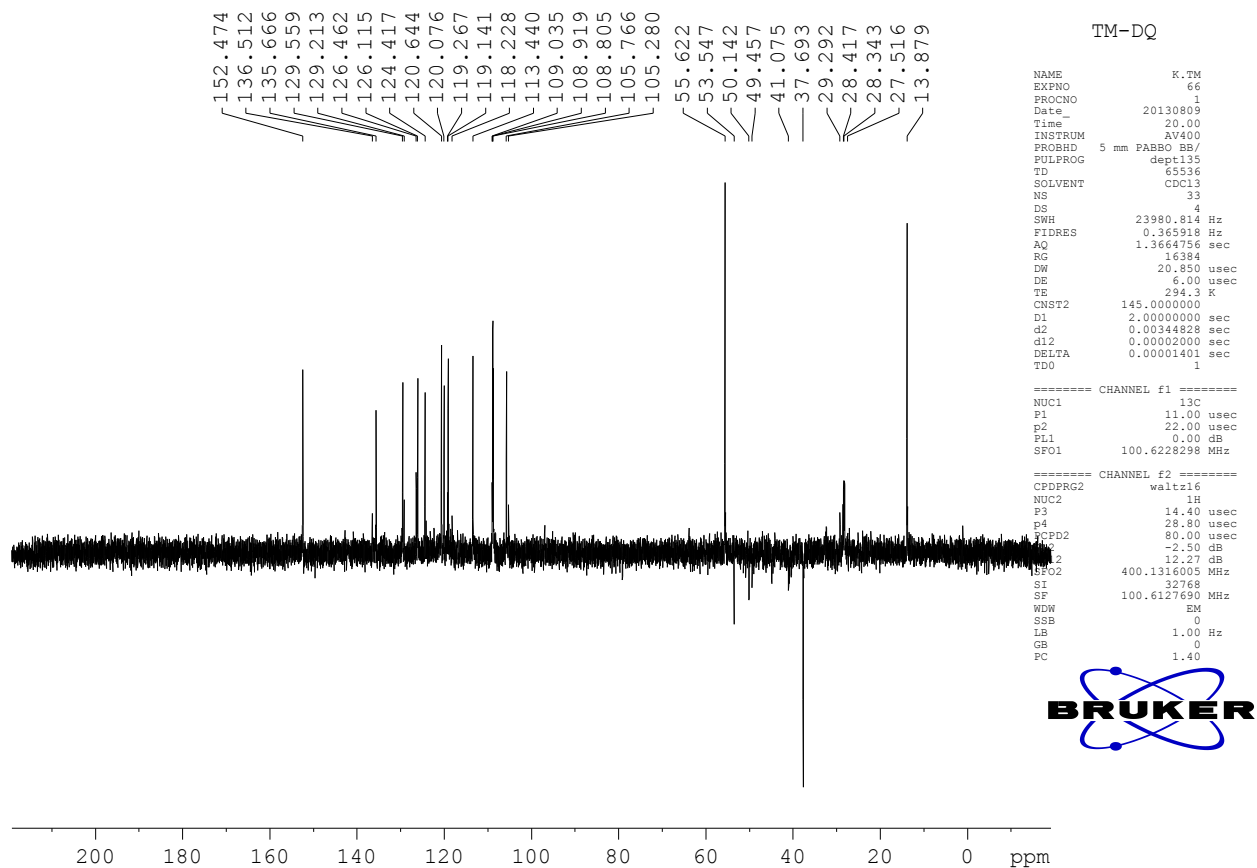
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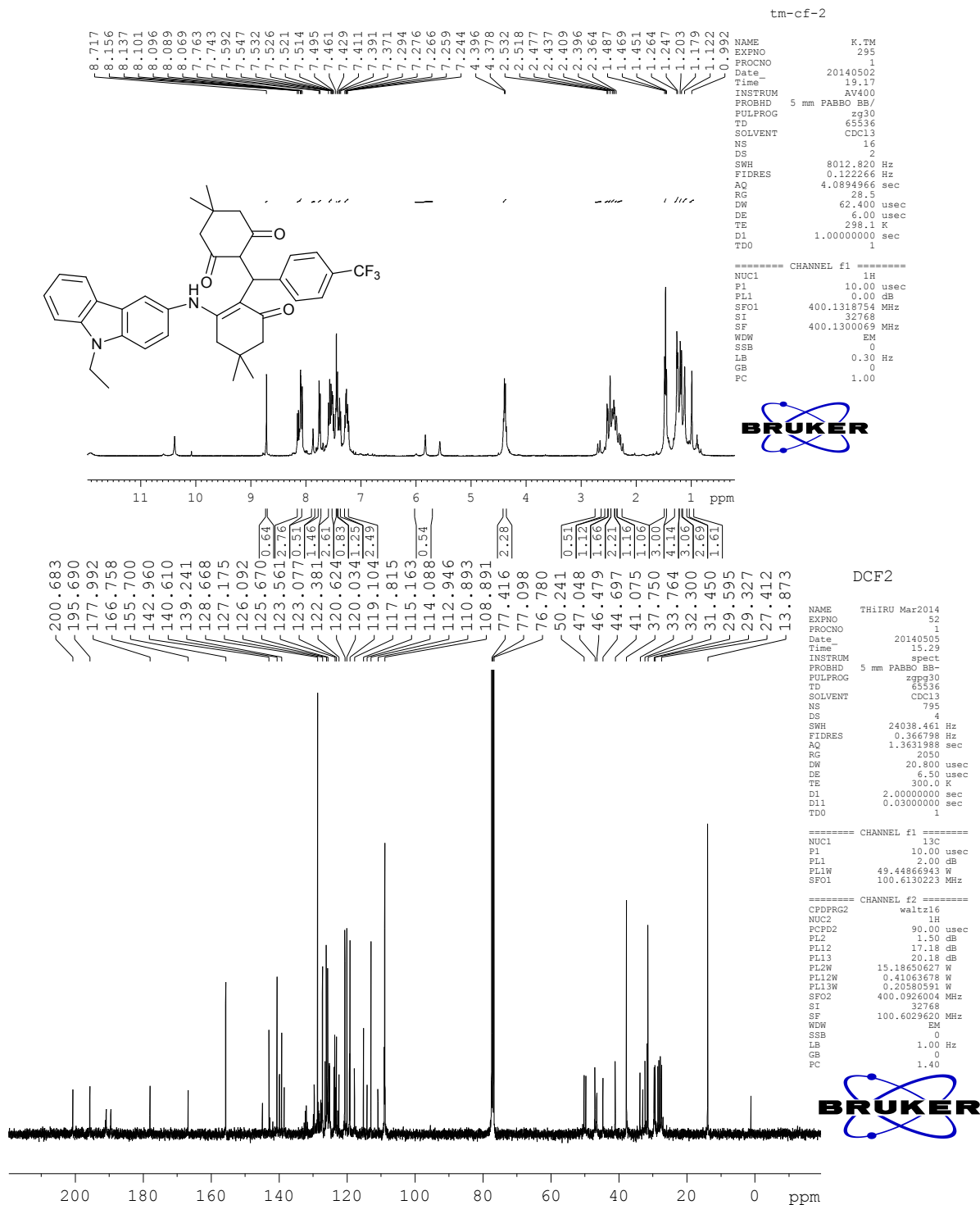
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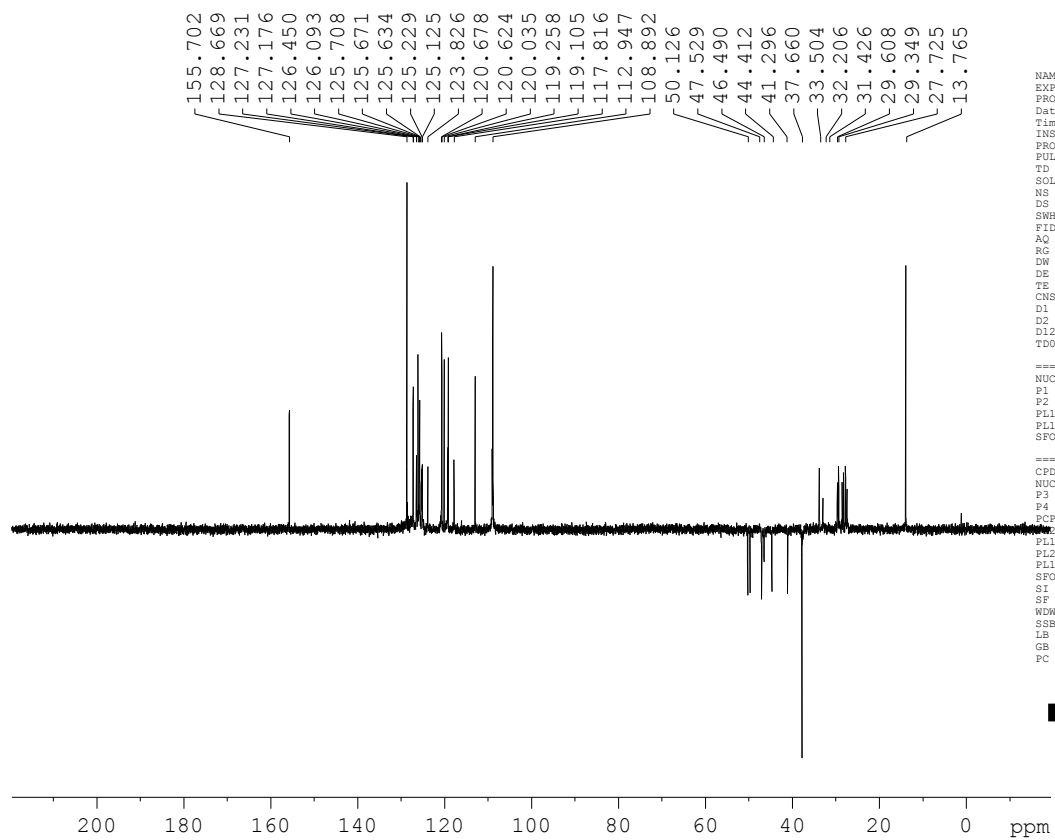
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NUC2	1H
PCPD2	90.00 usec
PL2	1.50 dB
PL12	17.18 dB
PL13	20.18 dB
PL2W	15.18650627 W
PL12W	0.41063678 W
PL13W	0.20580591 W
SFO2	400.0926004 MHz
SI	32768
SF	100.6029620 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40





2-(((9-ethyl-9H-carbazol-3-yl)amino)-4,4-dimethyl-6-oxocyclohex-1-en-1-yl)(4-(trifluoromethyl)phenyl)methyl)-5,5-dimethylcyclohexane-1,3-dione (Table 2 entry 3 4c)





DCF2

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TD         65536
SOLVENT   CDCl3
NS         191
DS         4
SWH        24039.461 Hz
FIDRES     0.366798 Hz
AQ         1.3631988 sec
RG         2050
DM         20.800 usec
DE         6.50 usec
TE         300.0 K
CNST2     145.0000000
D1         2.00000000 sec
D2         0.00344828 sec
D12        0.00002000 sec
TD0        1

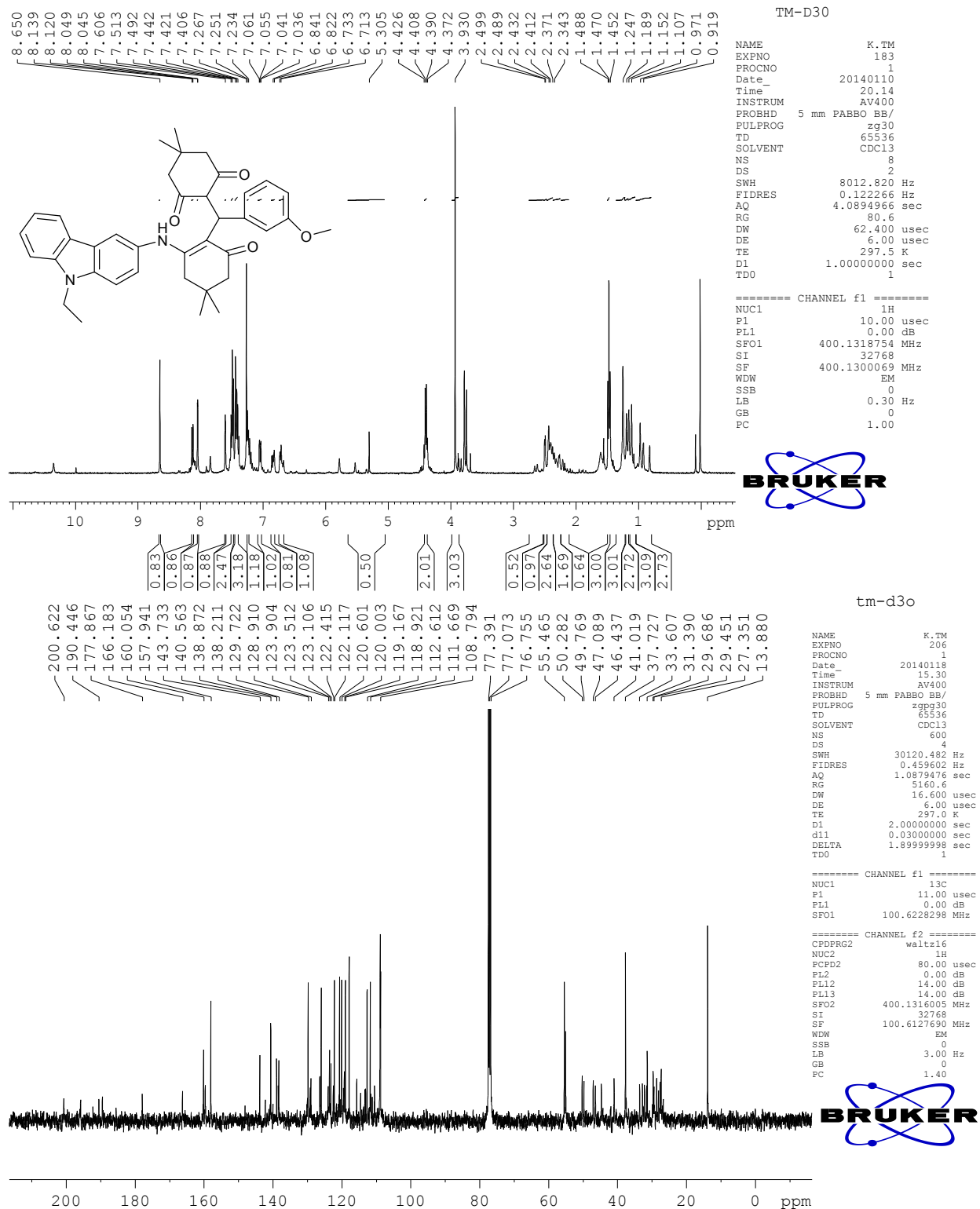
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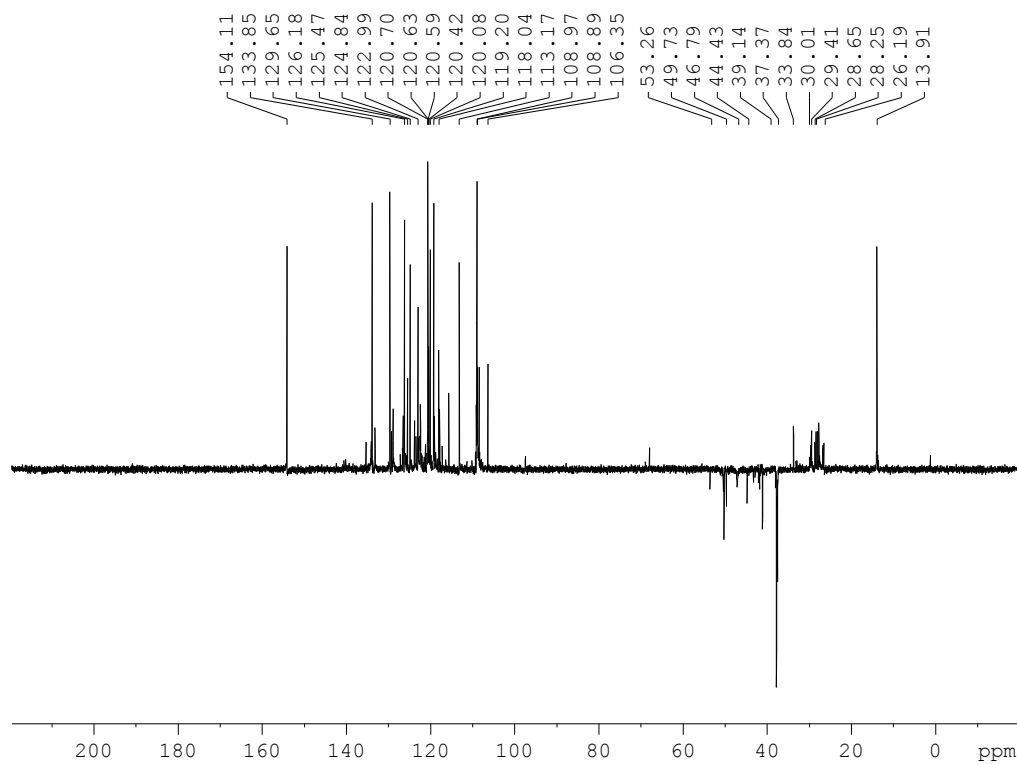
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NUC2       1H
P3         14.80 usec
P4         29.60 usec
PCPD2      90.00 usec
PL2        1.50 dB
PL12       17.18 dB
PL2W       15.18690627 W
PL12W      0.41063678 W
SFO2       400.0926004 MHz
SI         32768
SF         100.6029620 MHz
WDW        EM
SSB        0
LB         1.00 Hz
GB         0
PC         1.40

```



2-(((9-ethyl-9H-carbazol-3-yl)amino)-4,4-dimethyl-6-oxocyclohex-1-en-1-yl)(3-methoxyphenyl)methyl)-5,5-dimethylcyclohexane-1,3-dione (Table 2 entry 4 d)





DCFd3no

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Time_         16.08
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PULPROG       dept135
TD            65536
SOLVENT       CDC13
NS            256
DS            4
SWH           24038.461 Hz
FIDRES        0.366798 Hz
AQ            1.3631988 sec
RG            2050
DW            20.800 usec
DE            6.50 usec
TE            298.7 K
CNST2         145.0000000
D1            2.00000000 sec
D2            0.00344828 sec
D12           0.00002000 sec
TD0           1

```

```

===== CHANNEL f1 =====
NUC1          13C
P1            10.00 usec
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PL1           2.00 dB
PL1W          49.44866943 W
SFO1          100.6130223 MHz

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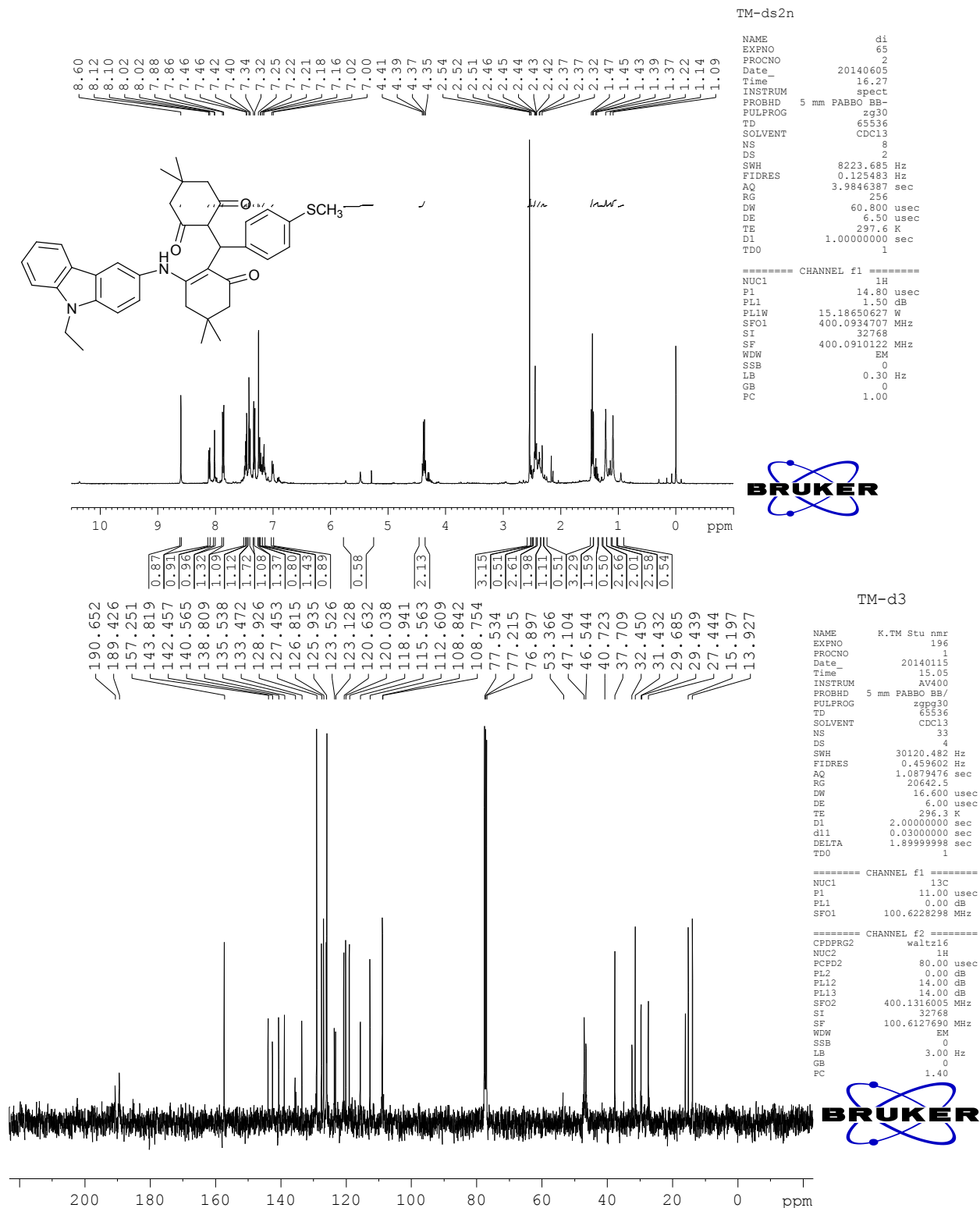
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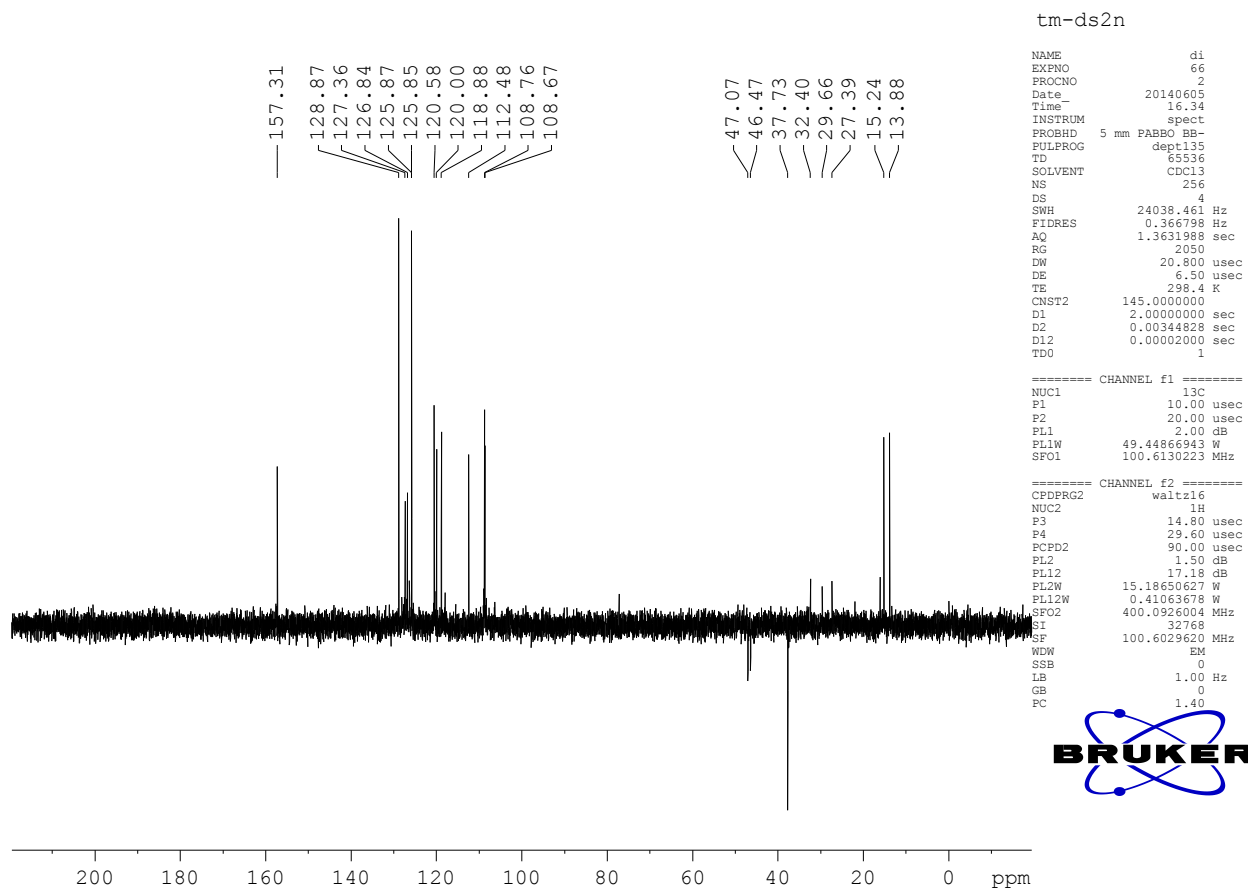
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NUC2           1H
F3            14.80 usec
P4            29.60 usec
PCPD2         90.00 usec
PL2           1.50 dB
PL12          17.18 dB
PL2W          15.18650627 W
PL12W         0.41063678 W
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PC            1.40

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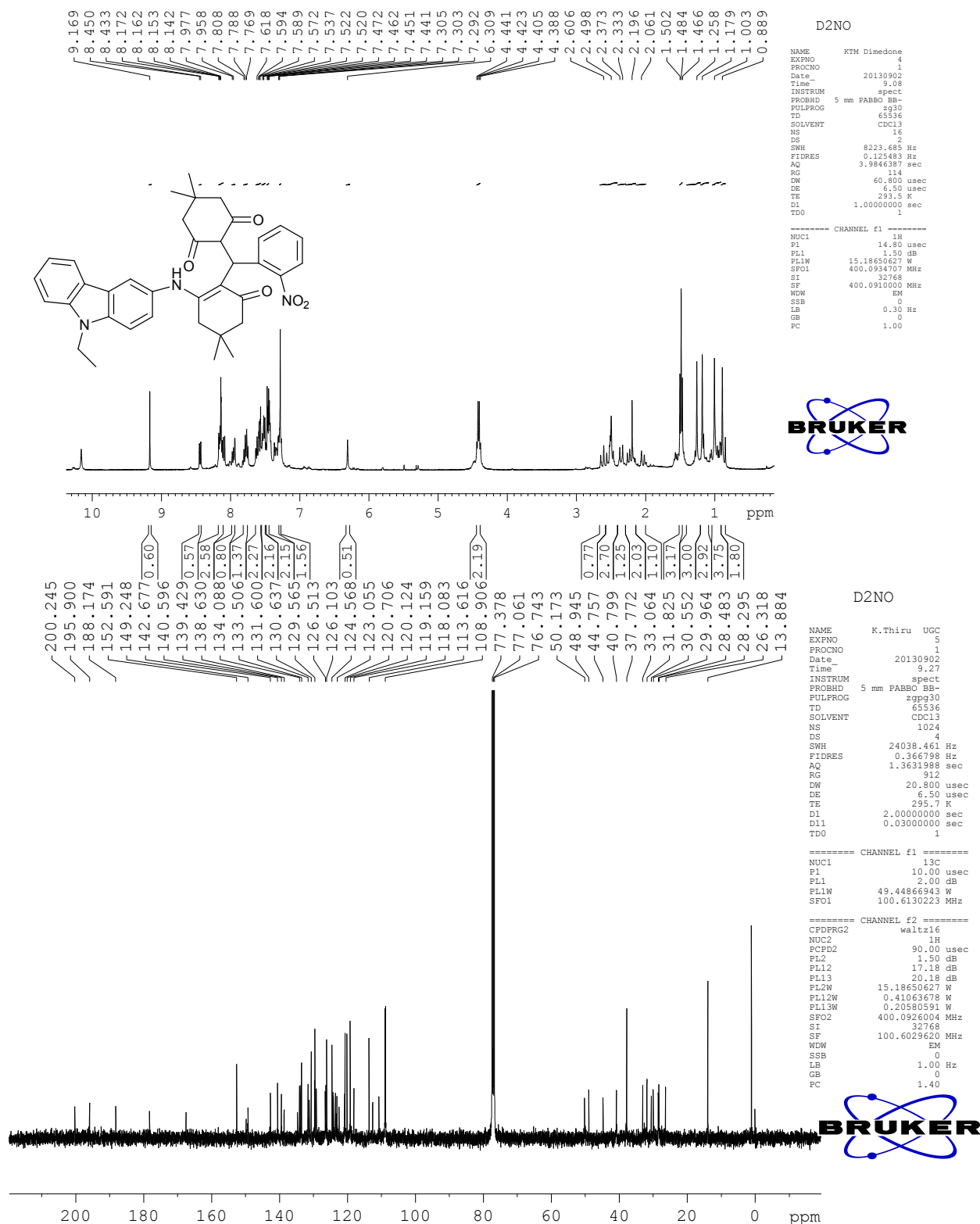


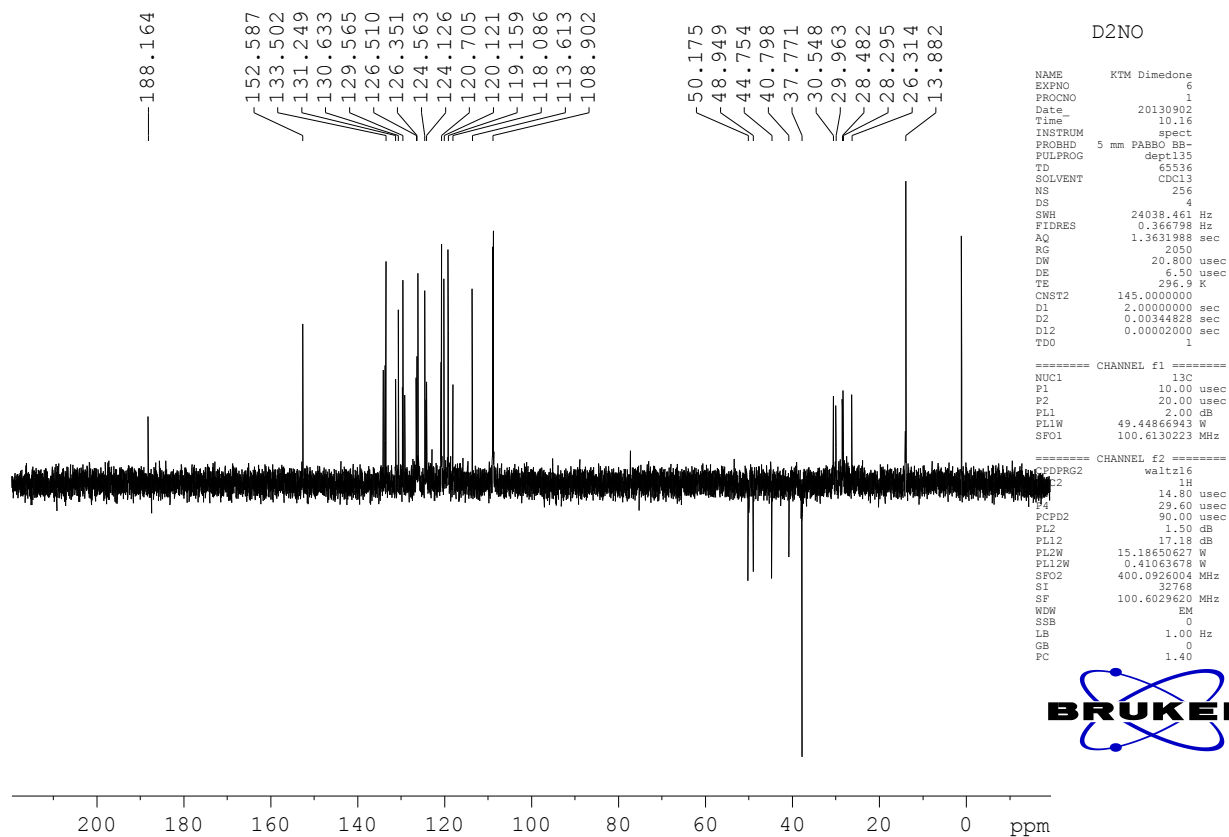
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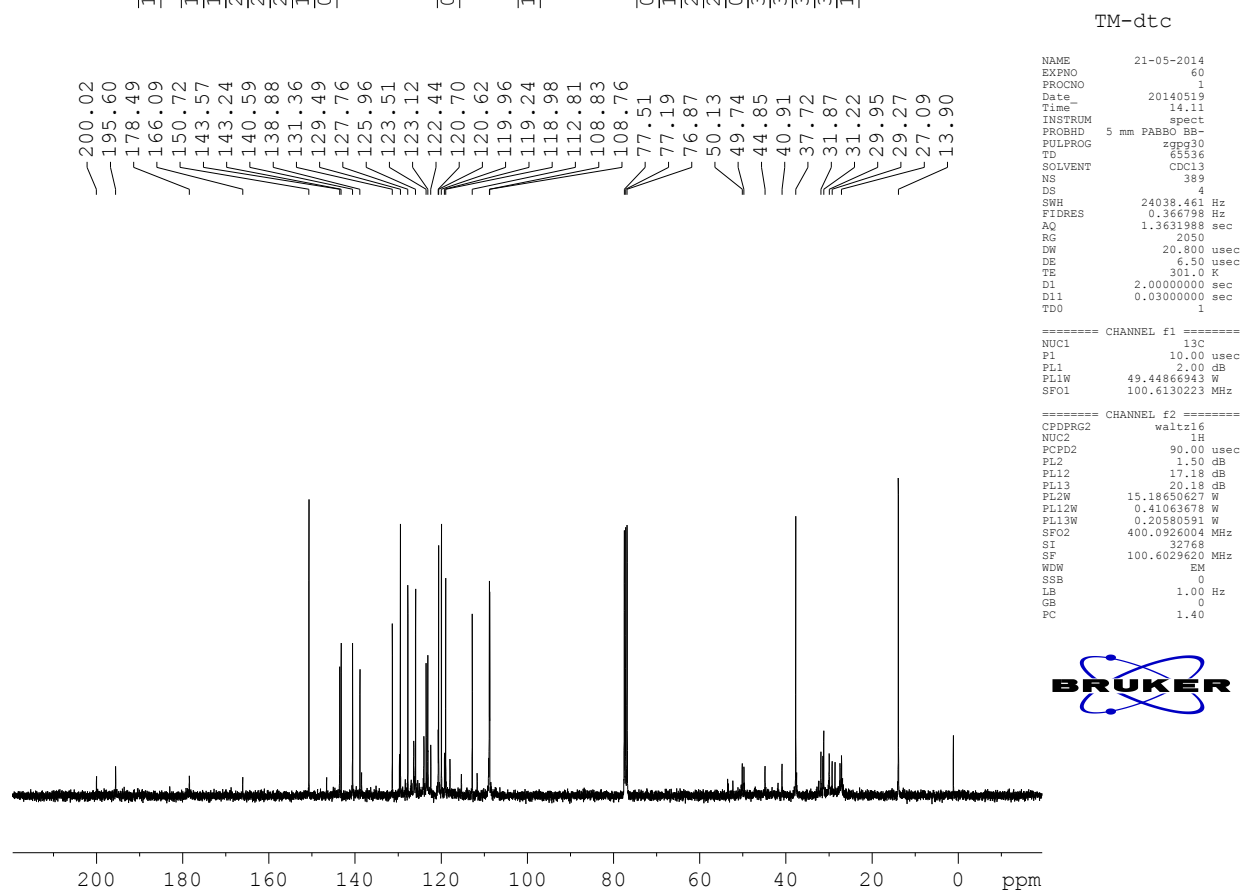
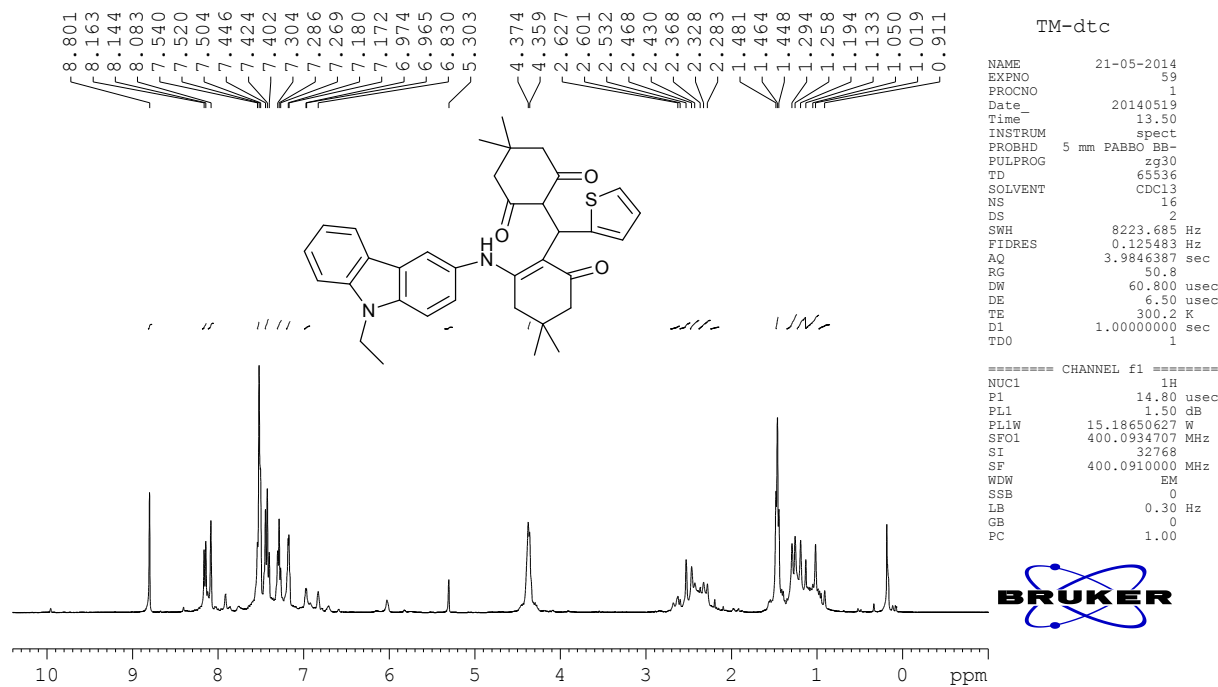


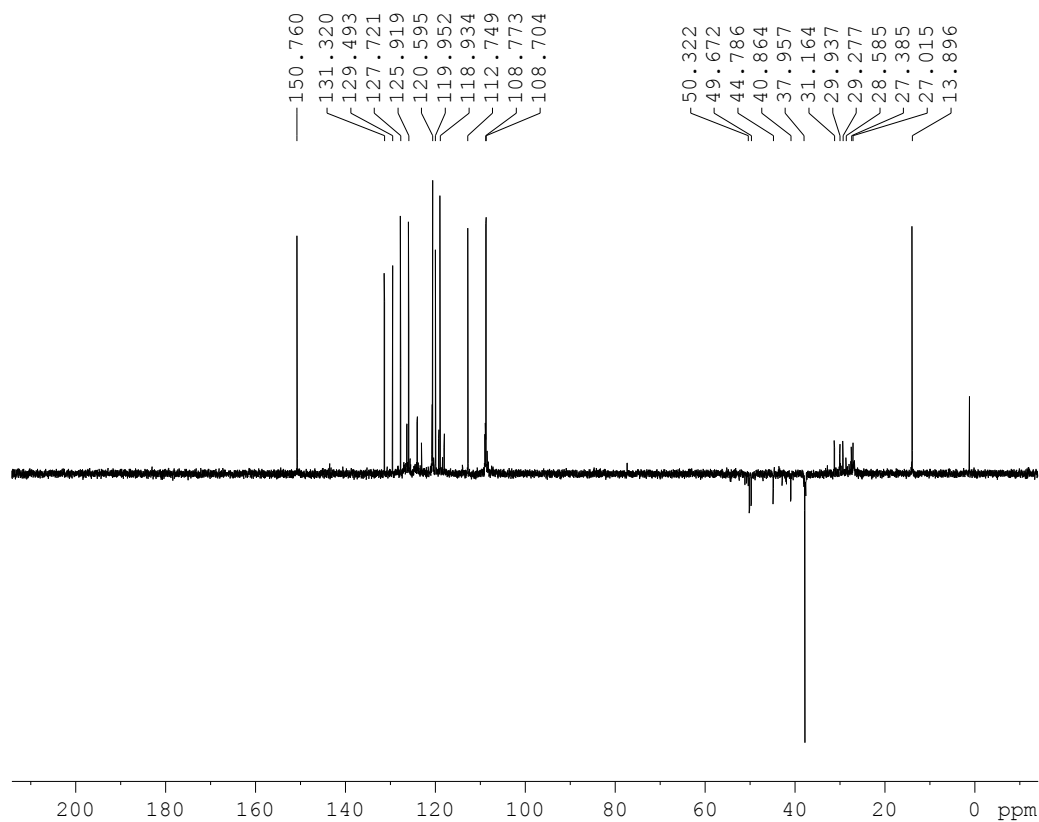
2-((2-((9-ethyl-9H-carbazol-3-yl)amino)-4,4-dimethyl-6-oxocyclohex-1-en-1-yl)(2-nitrophenyl)methyl)-5,5-dimethylcyclohexane-1,3-dione (Table 2 entry 6 4f)





2-((2-((9-ethyl-9H-carbazol-3-yl)amino)-4,4-dimethyl-6-oxocyclohex-1-en-1-yl)(thiophen-2-yl)methyl)-5,5-dimethylcyclohexane-1,3-dione (Table 2 entry 8 4g)





dtf

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TD         65536
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NS         512
DS         4
SWH        24038.461 Hz
FIDRES     0.366798 Hz
AQ         1.3631988 sec
RG         2050
DW         20.800 usec
DE         6.50 usec
TE         297.1 K
CNST2     145.0000000
D1         2.00000000 sec
D2         0.00344828 sec
D12        0.00002000 sec
TD0        1
  
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```

===== CHANNEL f1 =====
NUC1       13C
P1         10.00 usec
P2         20.00 usec
PL1        2.00 dB
PL1W       49.44866943 W
SFO1       100.6130223 MHz
  
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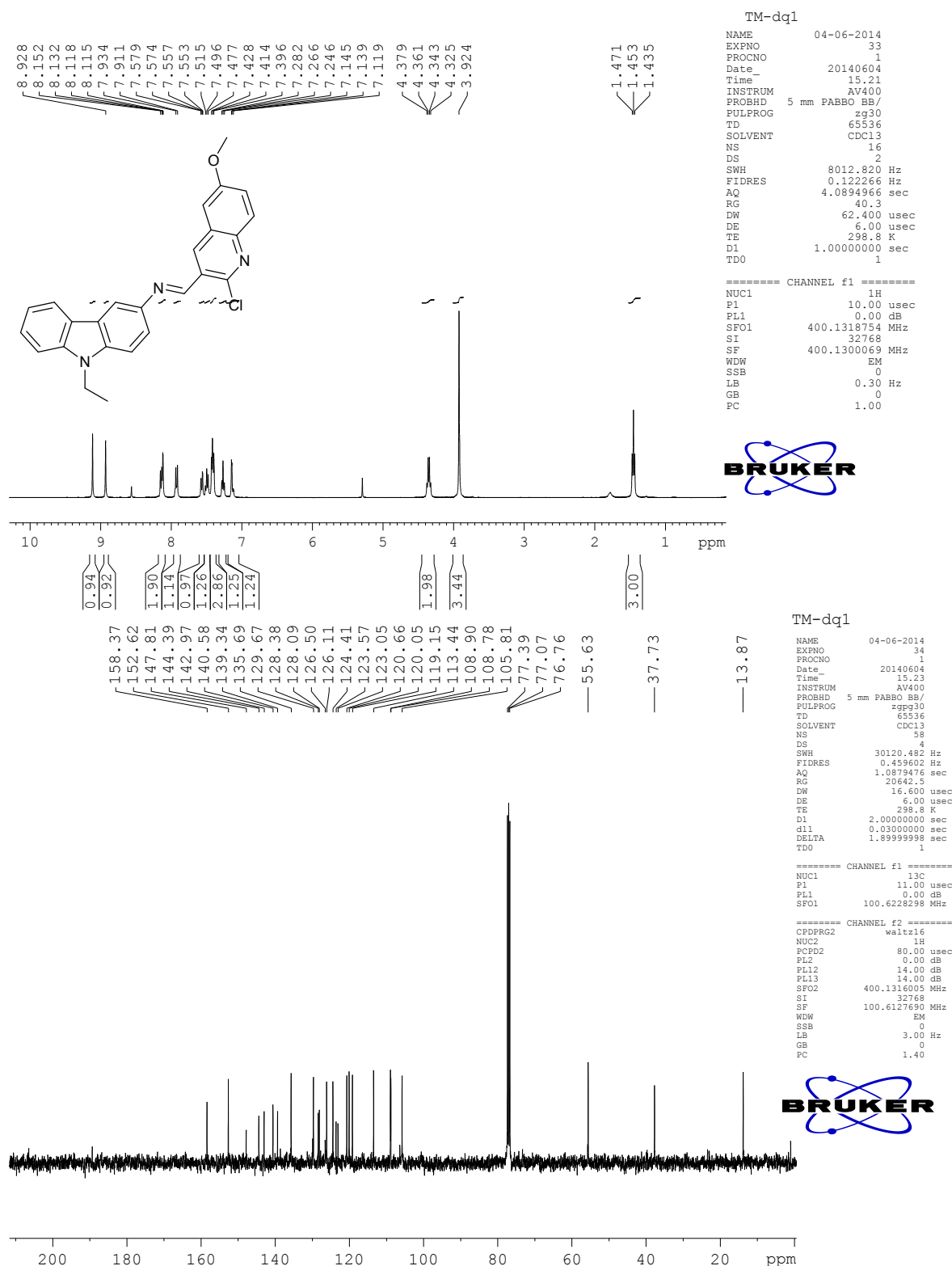
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NUC2       1H
P3         14.80 usec
P4         29.60 usec
PCPD2      90.00 usec
PL2        1.50 dB
PL12       17.18 dB
PL2W       15.18650627 W
PL12W      0.41063678 W
SFO2       400.0926004 MHz
S1         32768
SF         100.6029620 MHz
WDW        EM
SSB        0
LB         1.00 Hz
GB         0
PC         1.40
  
```

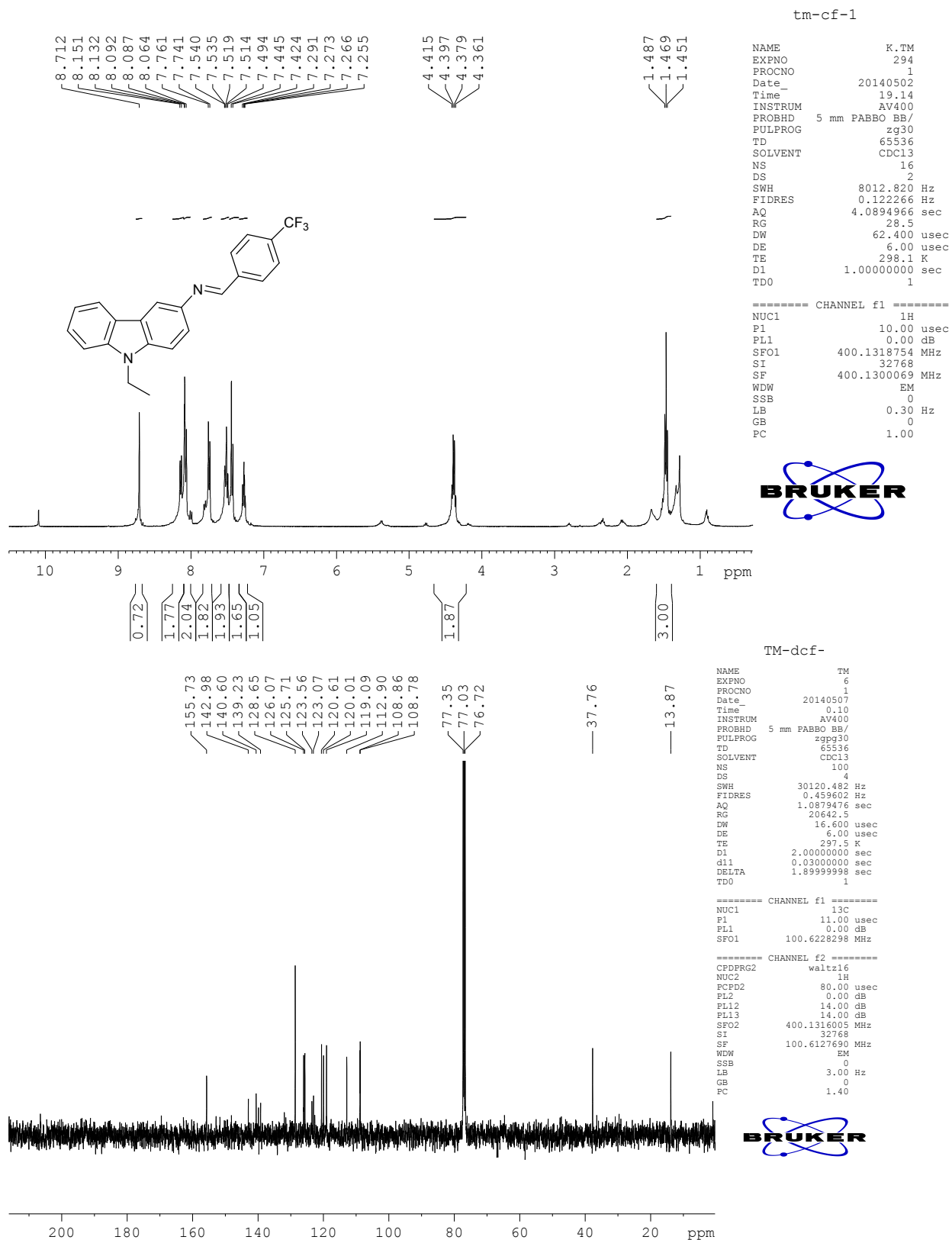


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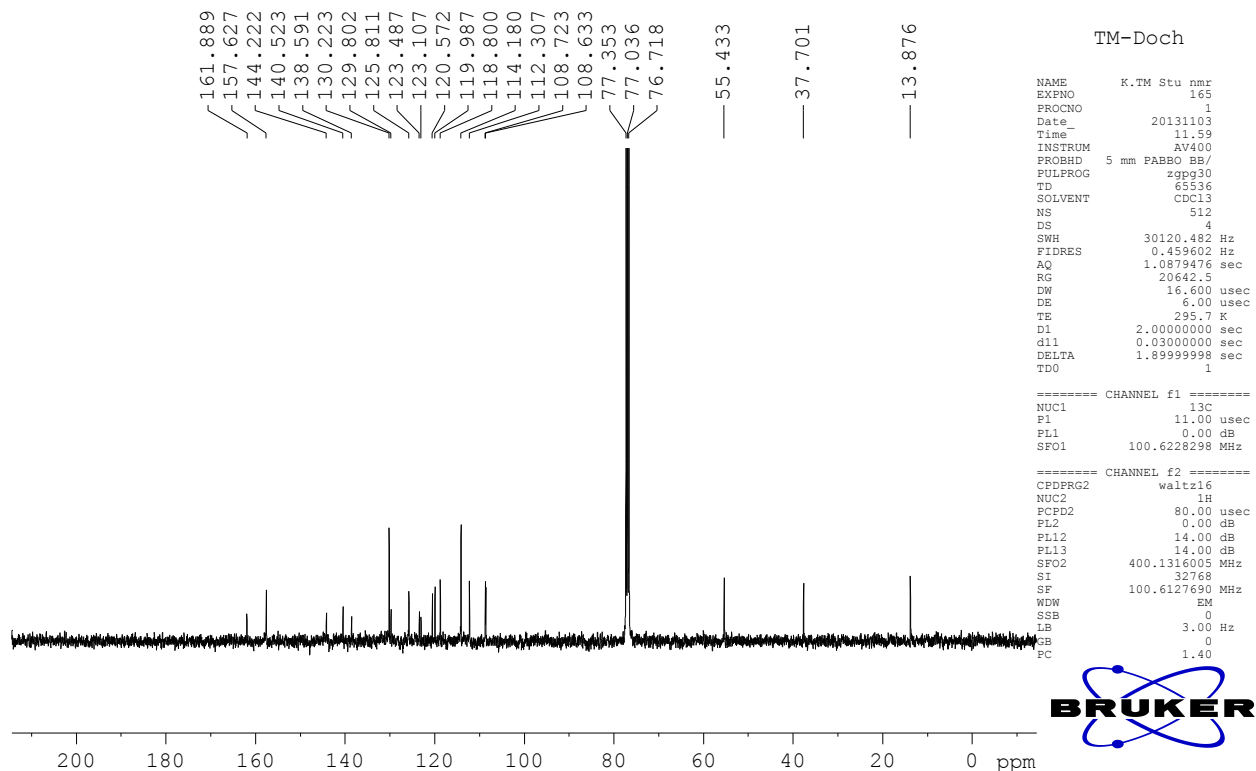
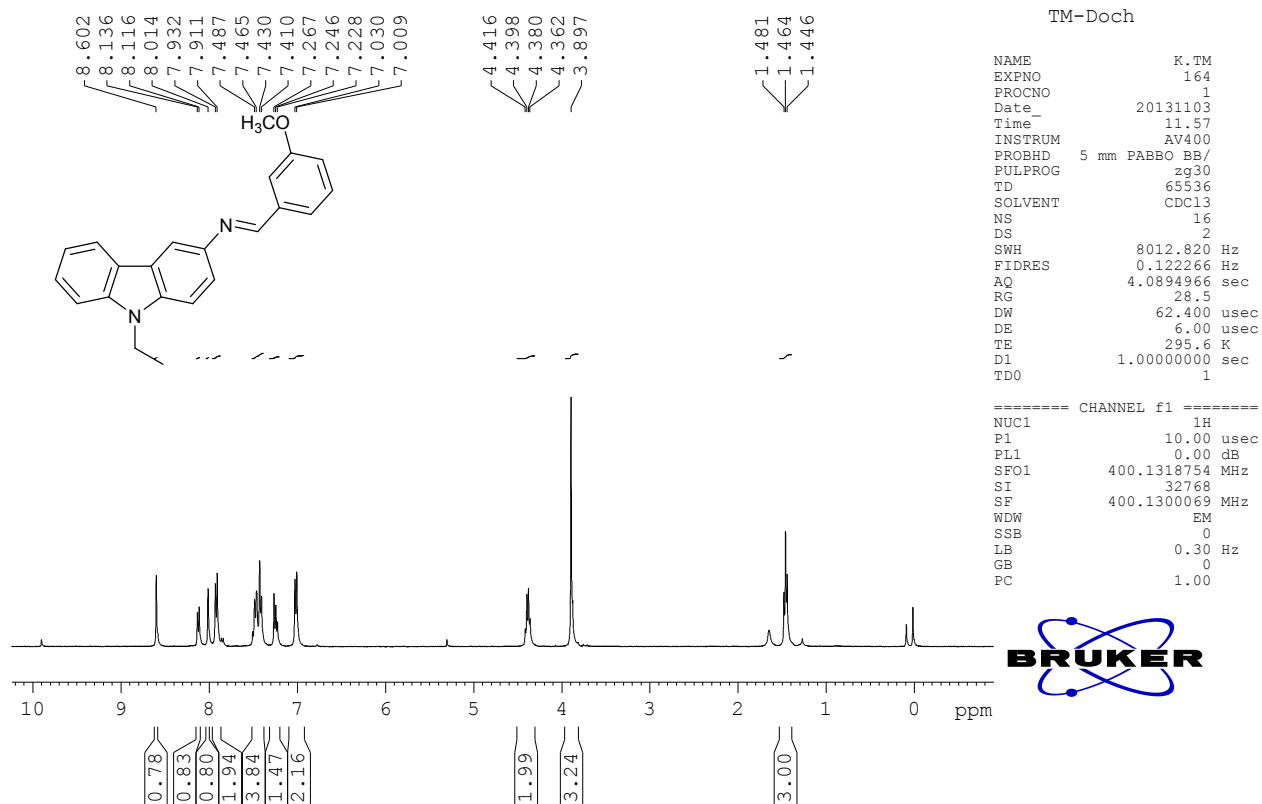
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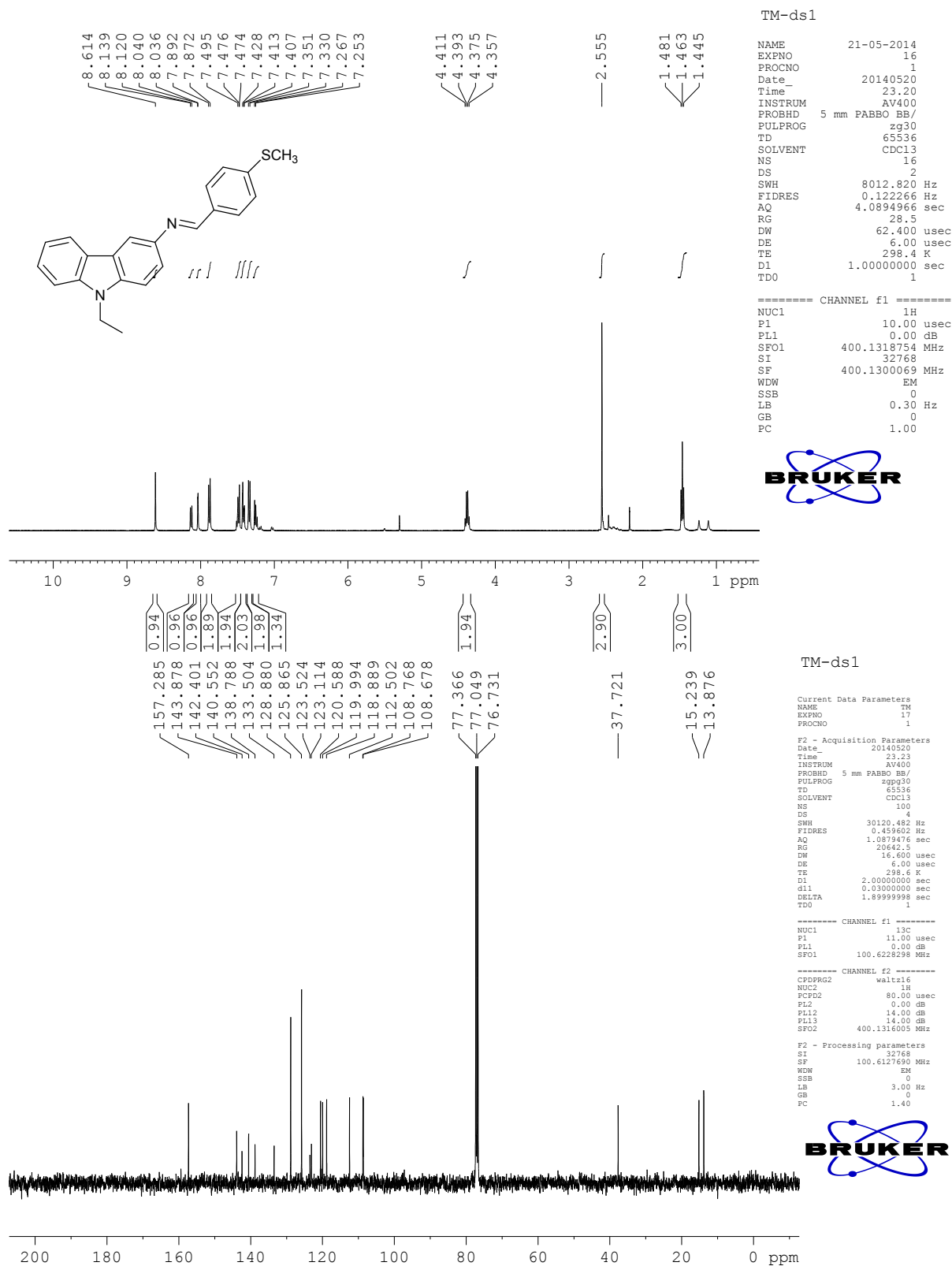
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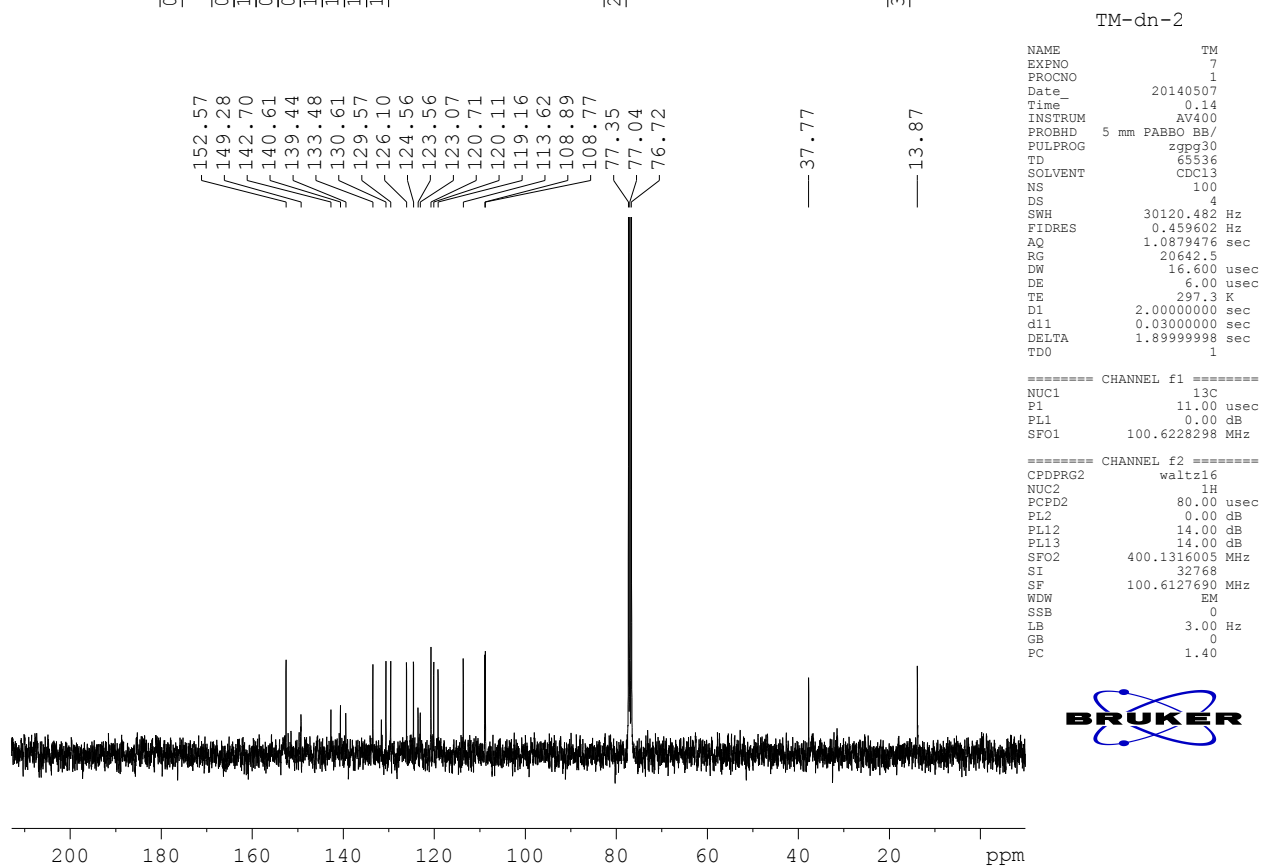
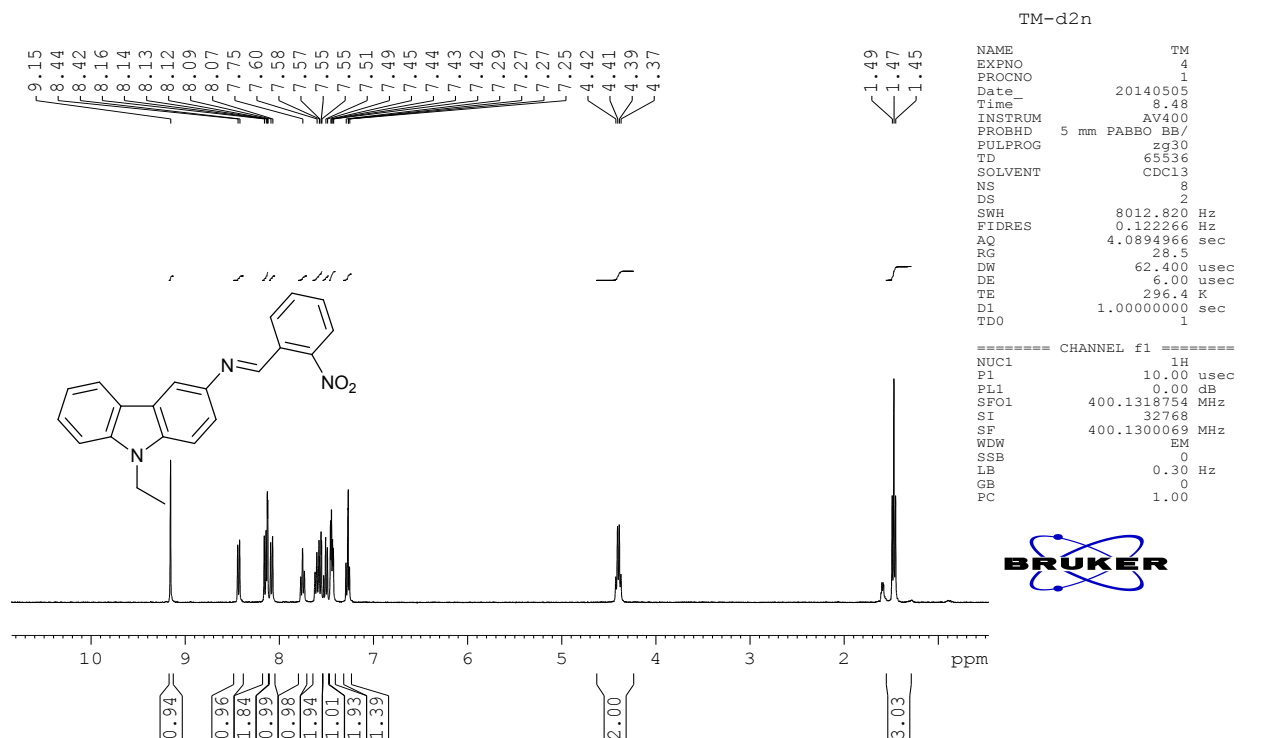
(E)-9-ethyl-N-(3-methoxybenzylidene)-9H-carbazol-3-amine (Table 2 entry 4 5d)



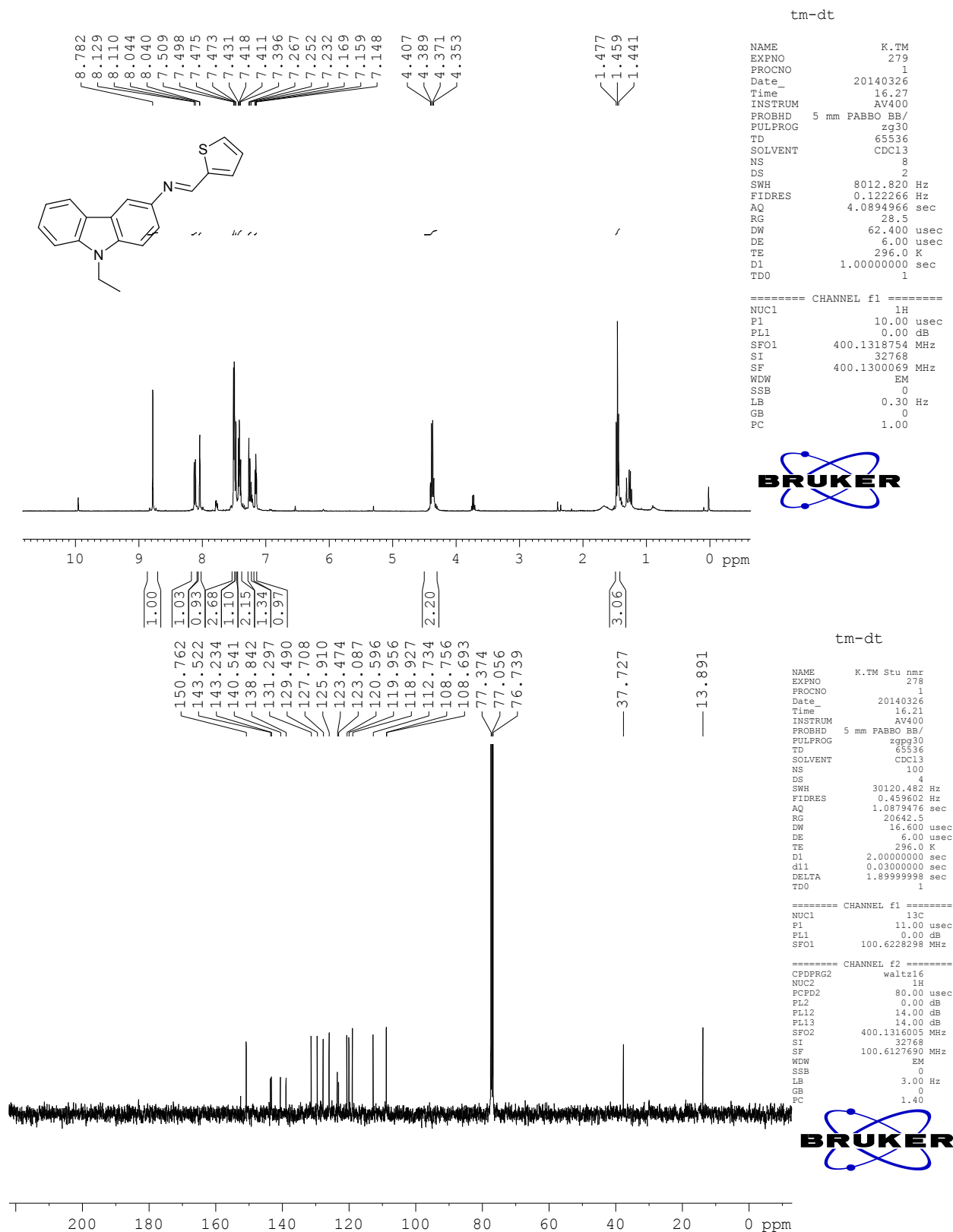
(E)-9-ethyl-N-(4-(methylthio)benzylidene)-9H-carbazol-3-amine (Table 2 entry 5 5e)



(E)-9-ethyl-N-(2-nitrobenzylidene)-9H-carbazol-3-amine (Table 2 entry 6 5f)



(E)-9-ethyl-N-(thiophen-2-ylmethylene)-9H-carbazol-3-amine (Table 2 entry 8 5g)



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Analysis Info

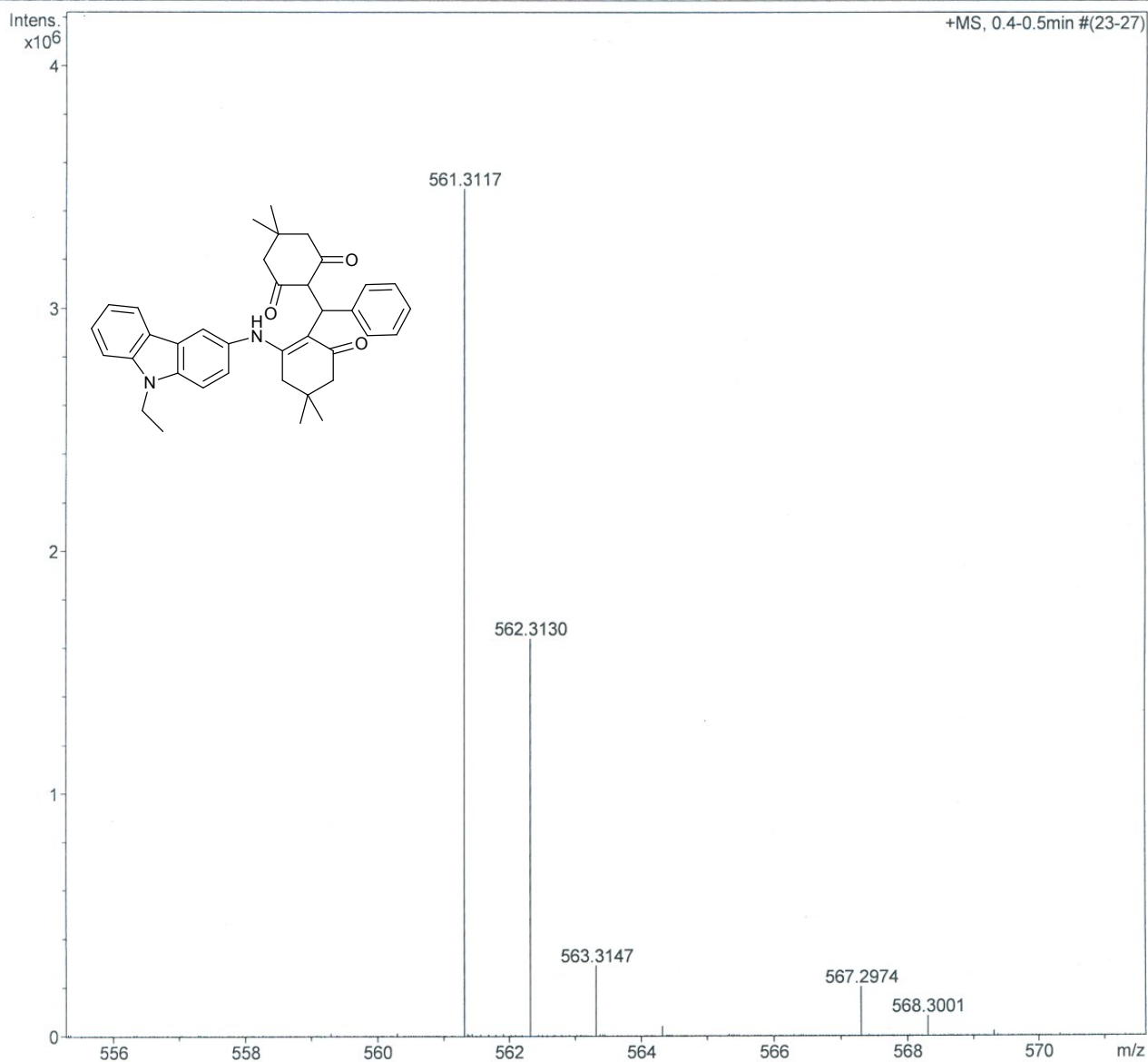
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Operator Ramu Sridhar
Instrument maXis 10138

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Analysis Info

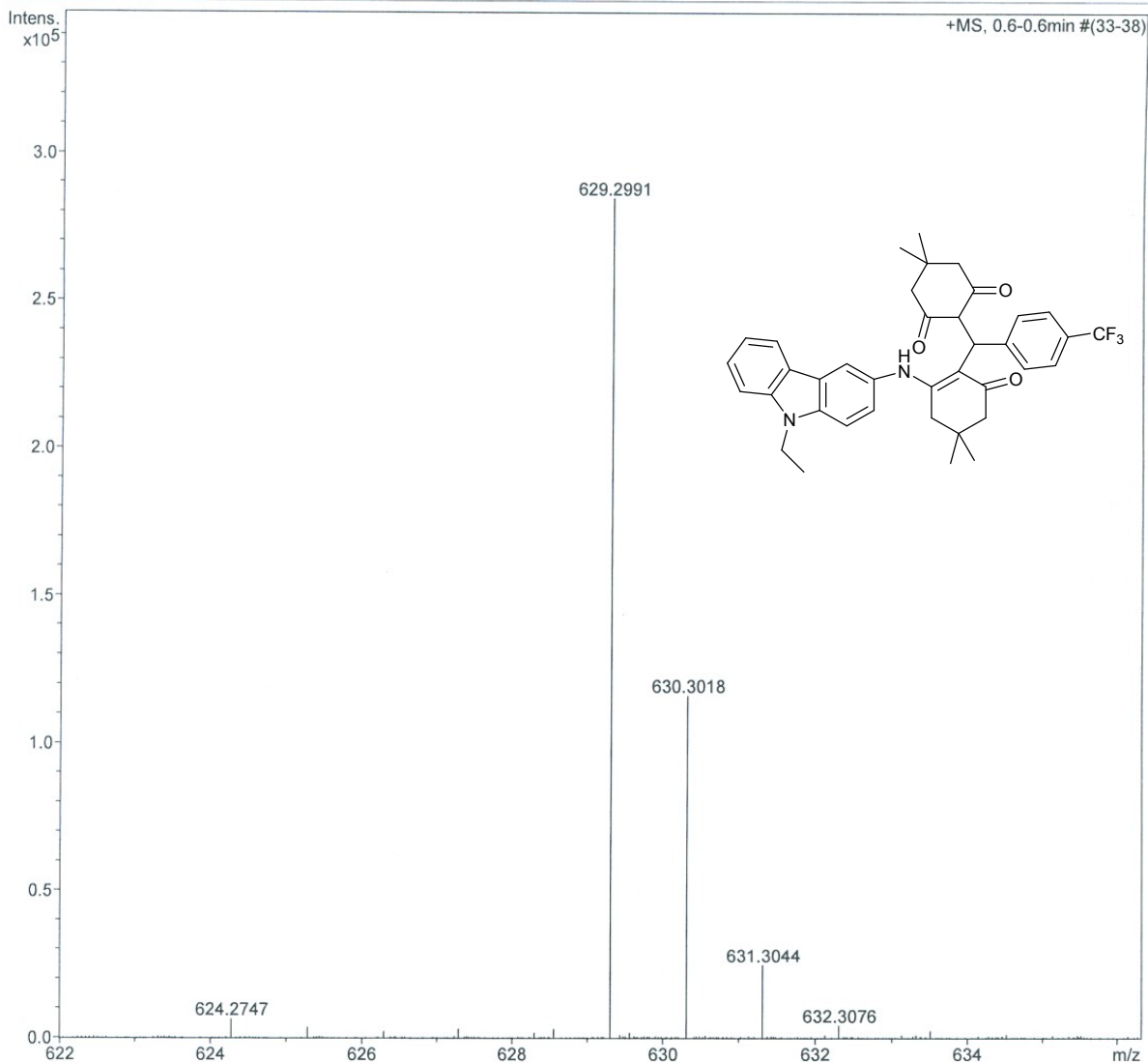
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Instrument maXis 10138

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Analysis Info

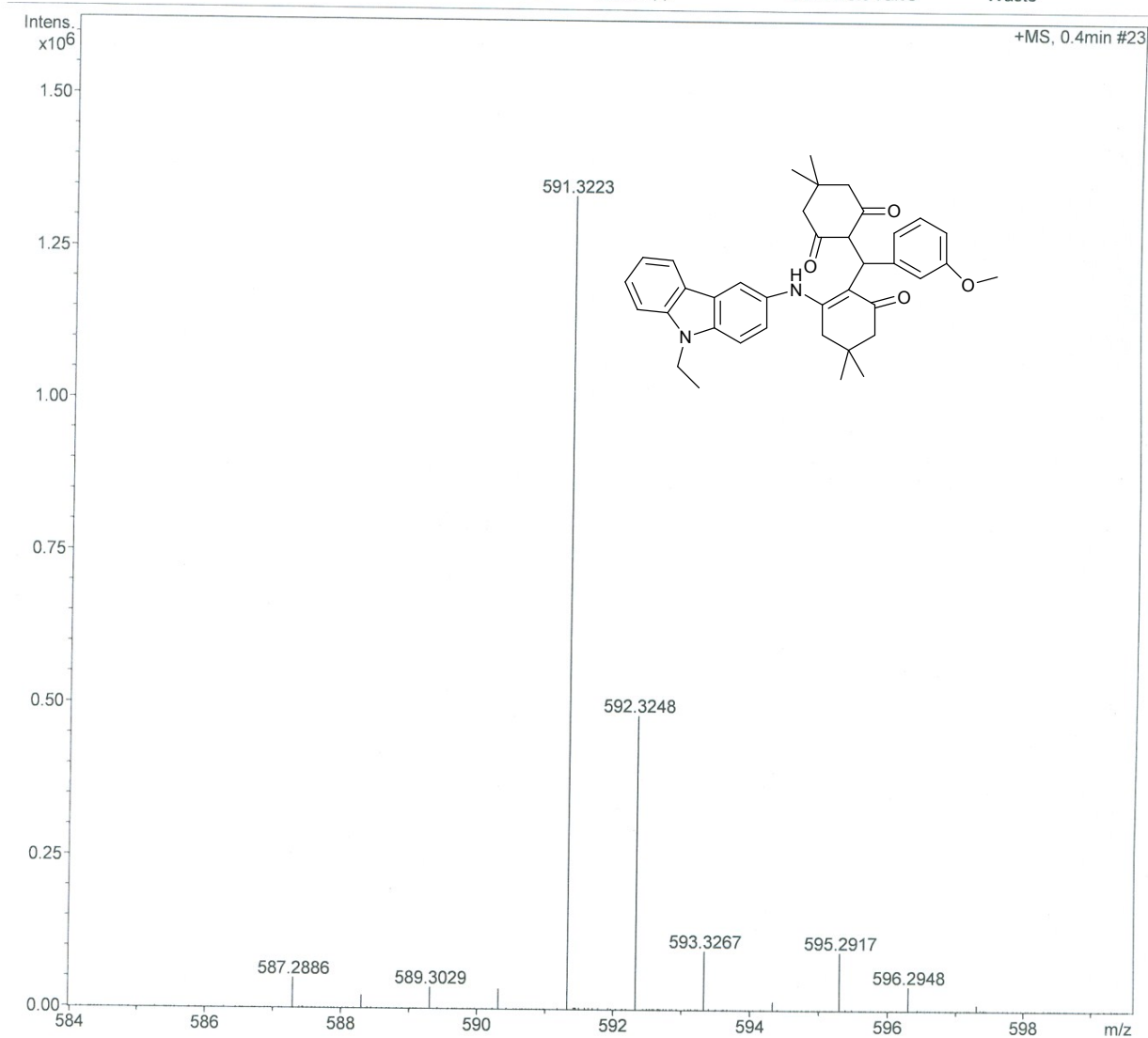
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Operator Ramu Sridhar
Instrument maXis 10138

Acquisition Parameter

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Analysis Info

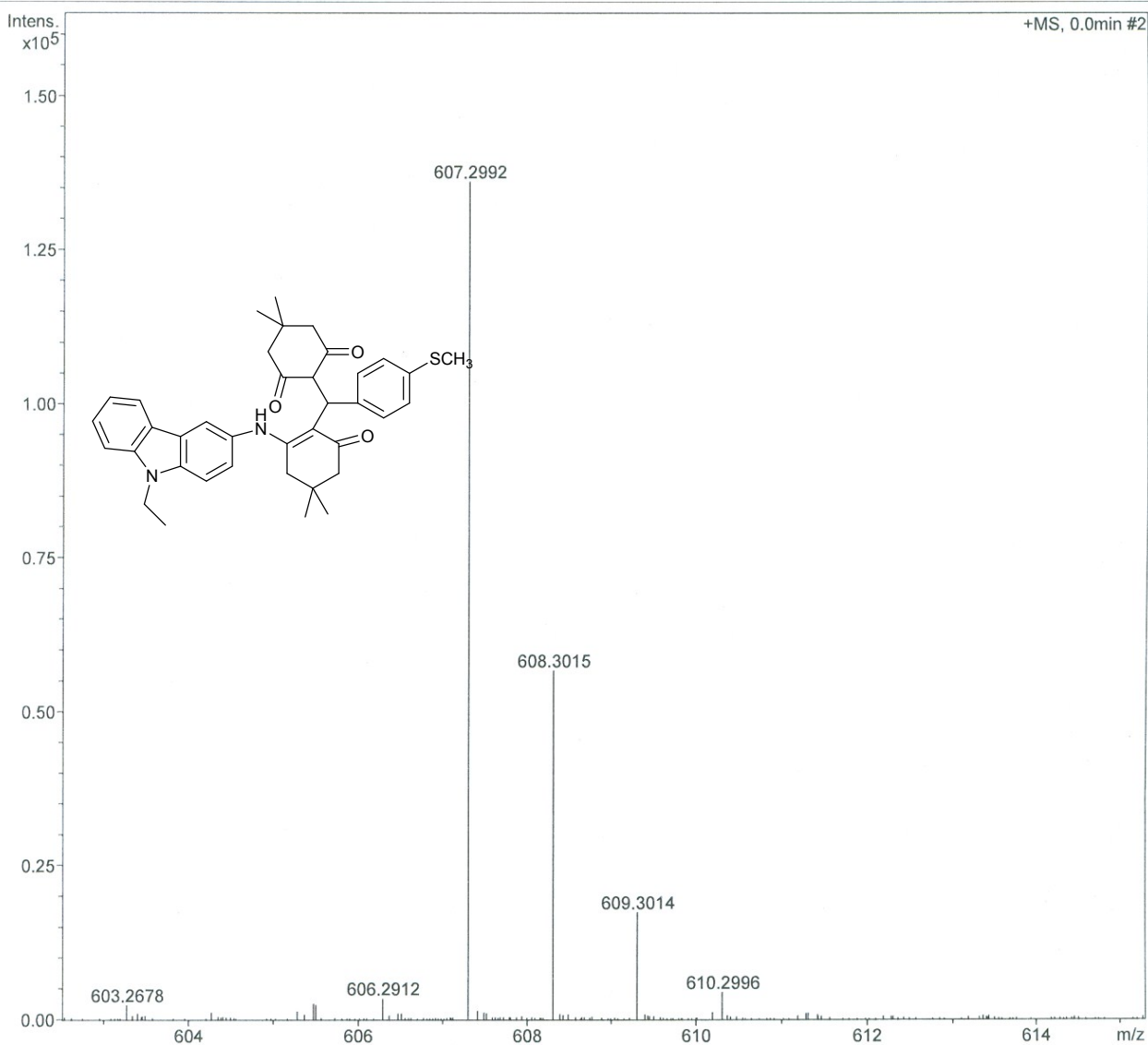
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Operator Ramu Sridhar
Instrument maXis 10138

Acquisition Parameter

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Analysis Info

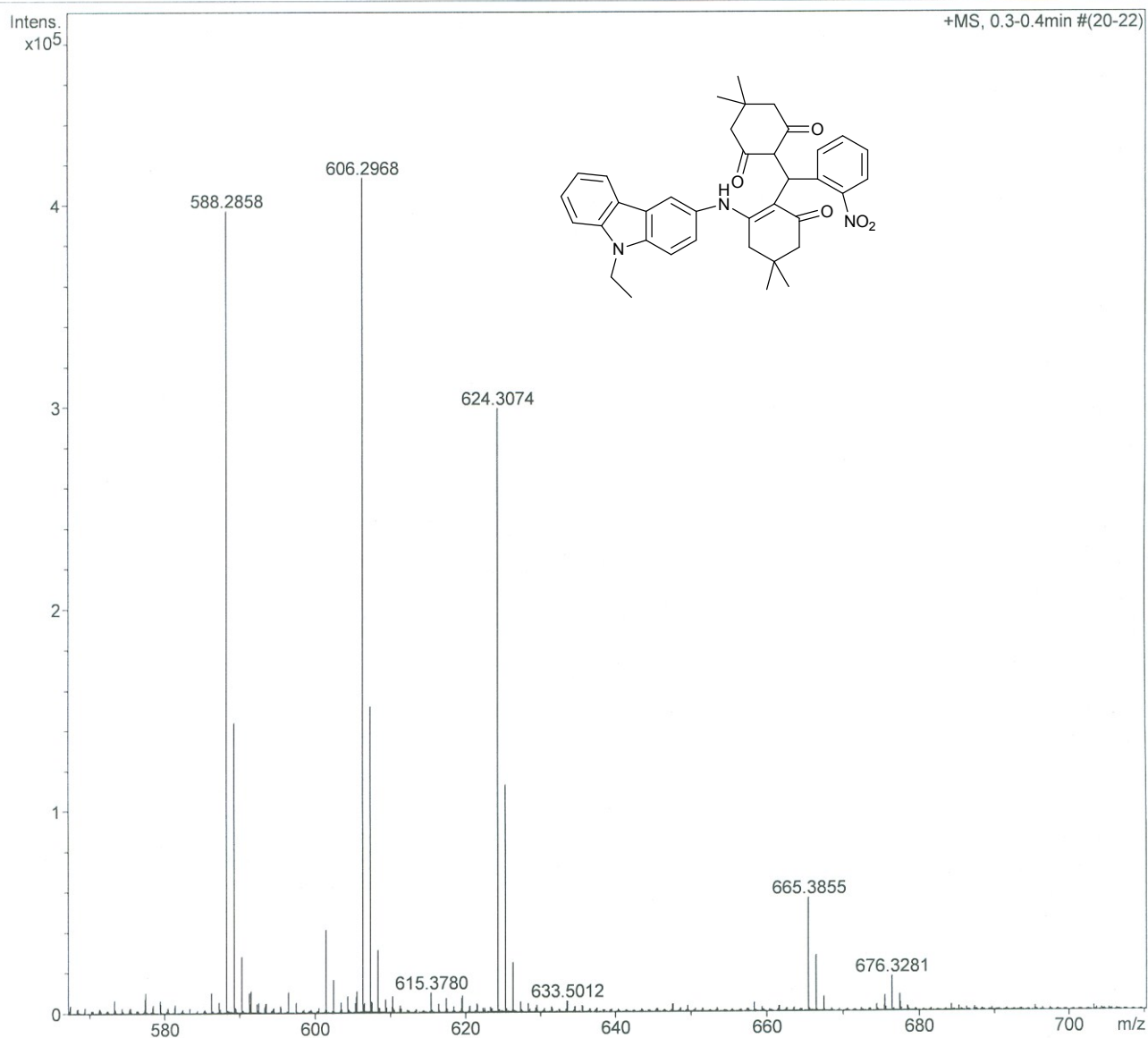
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Operator Ramu Sridhar
Instrument maXis 10138

Acquisition Parameter

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Analysis Info

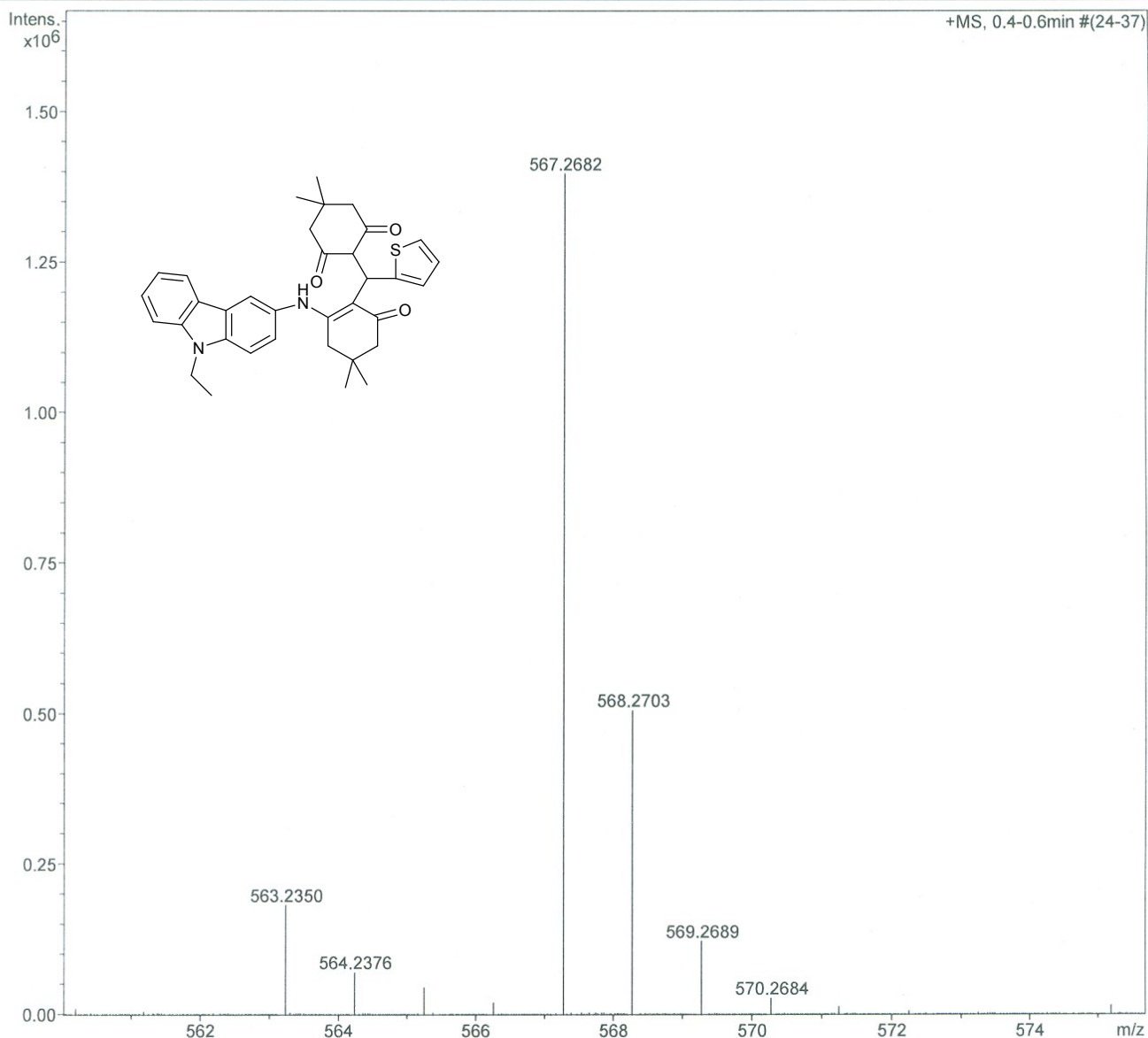
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Operator Ramu Sridhar
Instrument maXis 10138

Acquisition Parameter

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Analysis Info

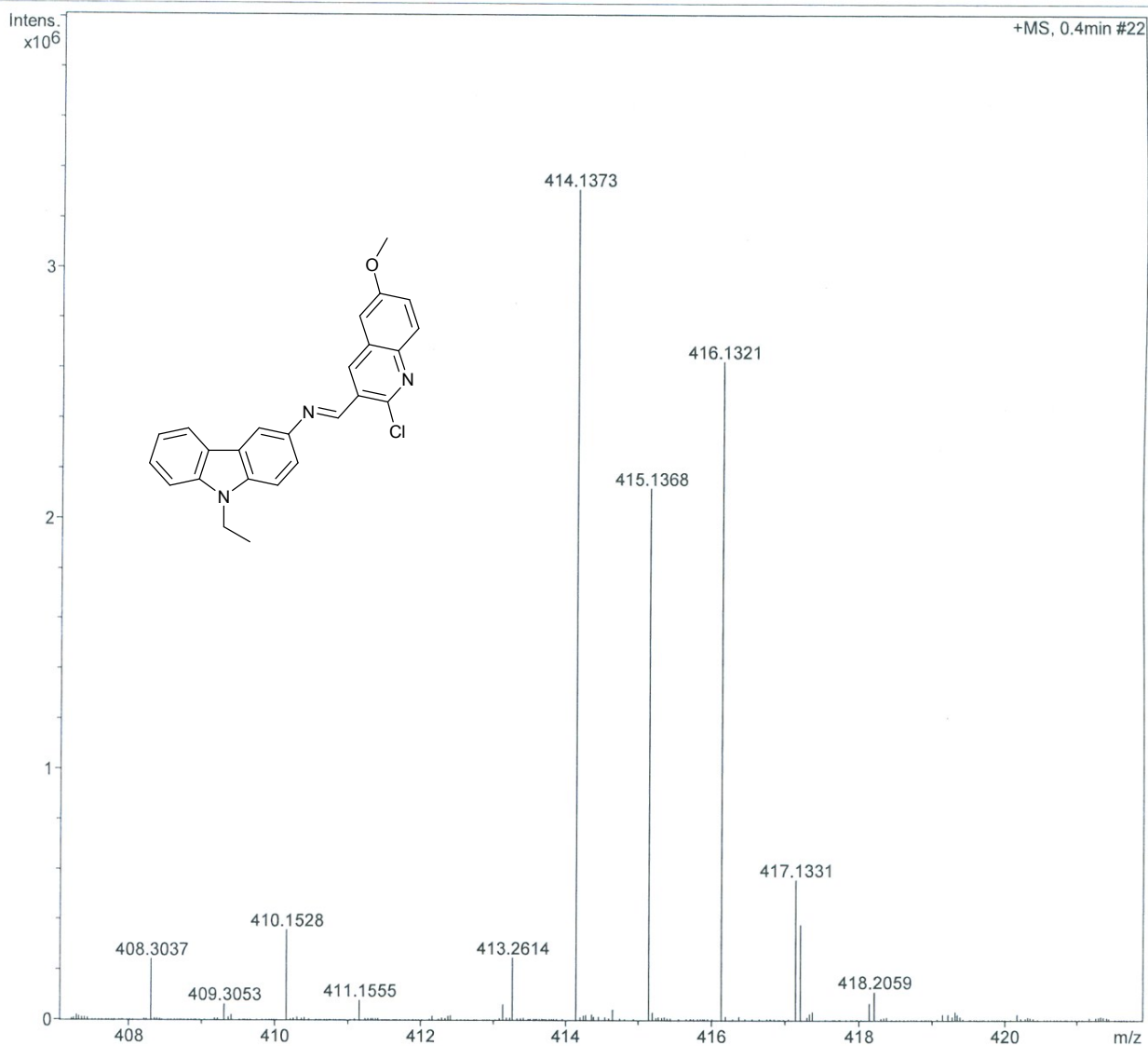
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Operator Ramu Sridhar
Instrument maXis 10138

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Analysis Info

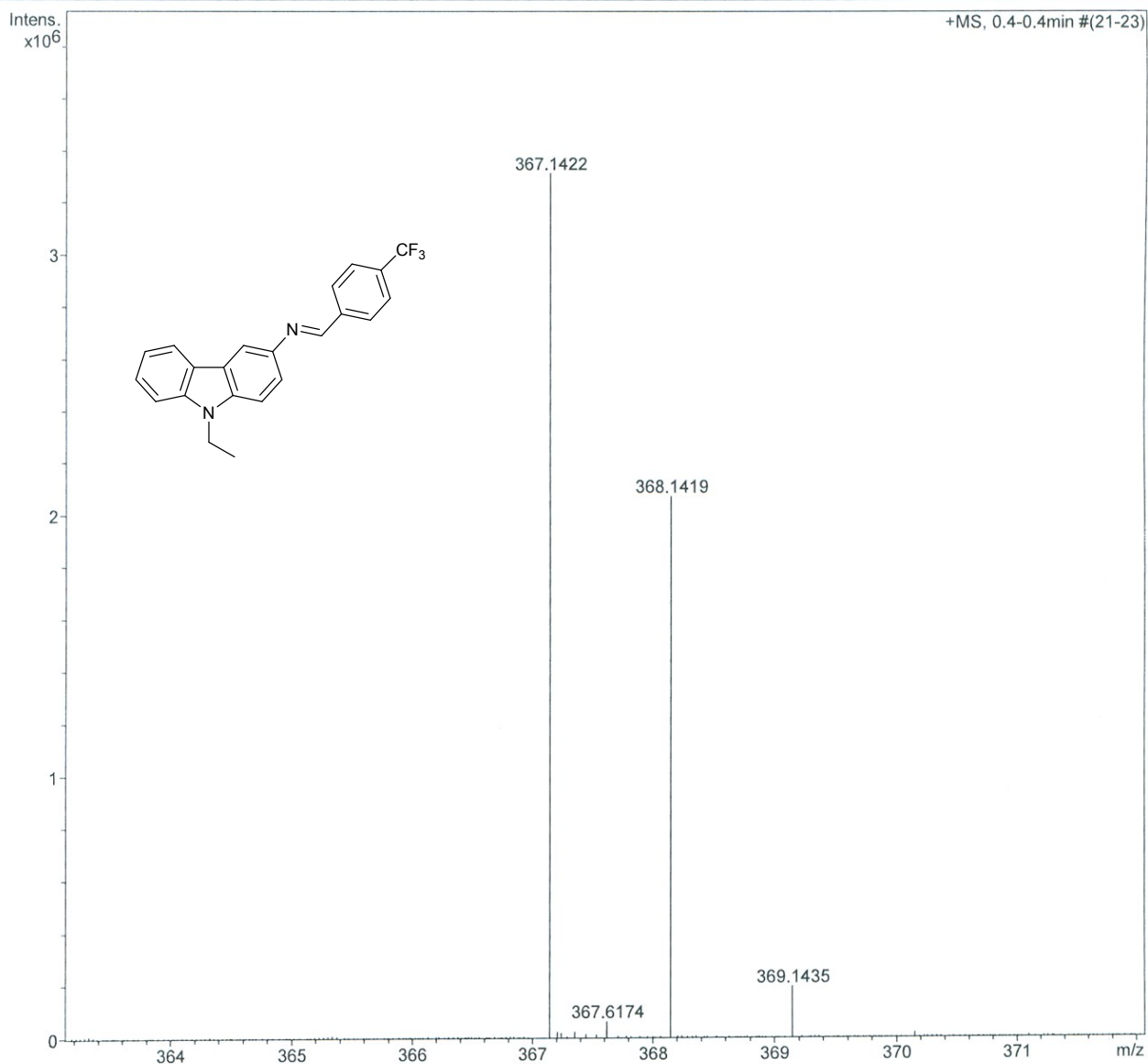
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Operator Ramu Sridhar
Instrument maXis 10138

Acquisition Parameter

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Focus	Not active	Set Capillary	4500 V	Set Dry Heater	200 °C
Scan Begin	50 m/z	Set End Plate Offset	-500 V	Set Dry Gas	4.0 l/min
Scan End	1800 m/z	Set Collision Cell RF	350.0 Vpp	Set Divert Valve	Waste



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Analysis Info

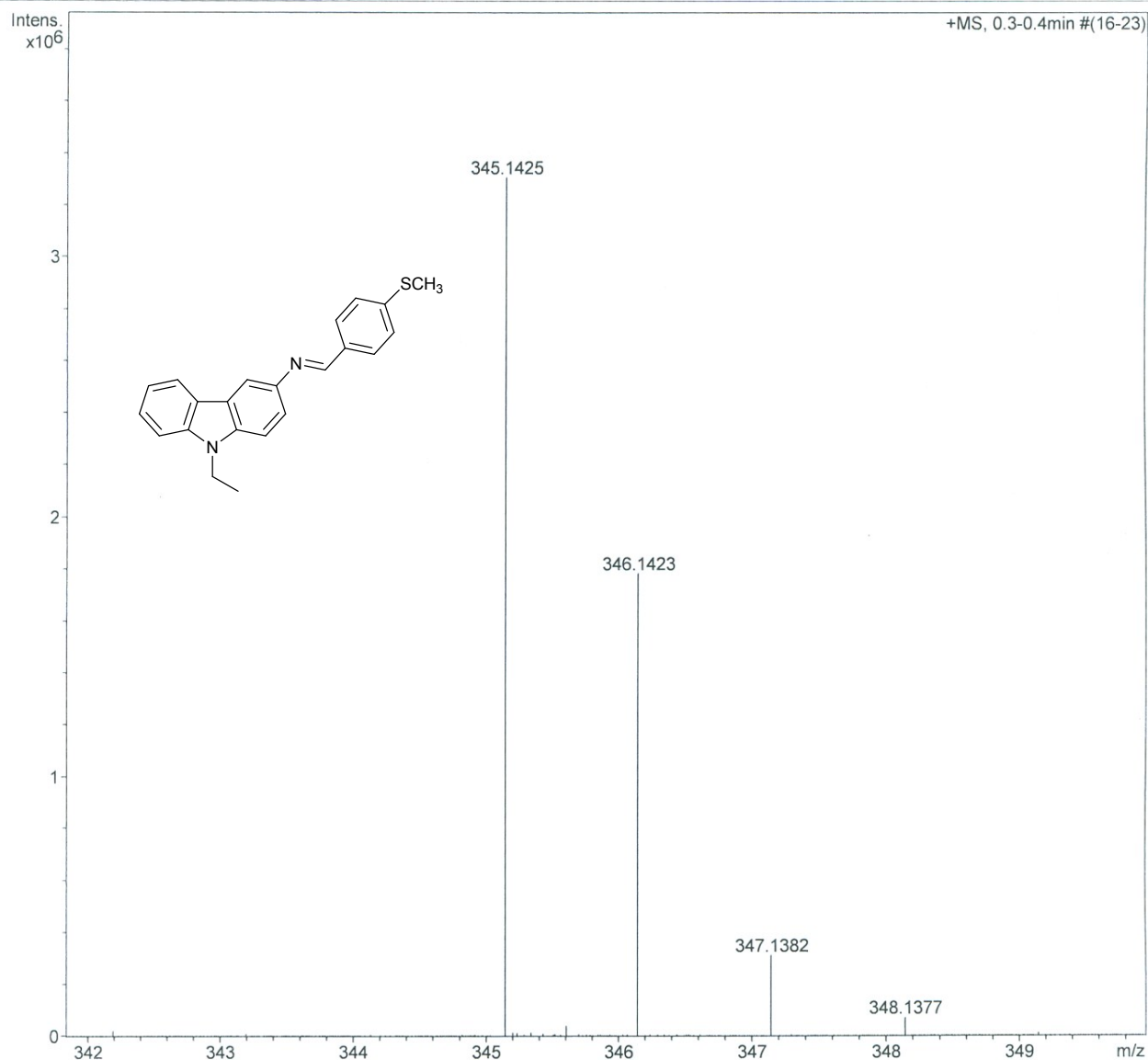
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Comment

Acquisition Date 6/5/2014 11:28:54 AM

Operator Ramu Sridhar
Instrument maXis 10138

Acquisition Parameter

Source Type	ESI	Ion Polarity	Positive	Set Nebulizer	4.4 psi
Focus	Not active	Set Capillary	4500 V	Set Dry Heater	200 °C
Scan Begin	50 m/z	Set End Plate Offset	-500 V	Set Dry Gas	4.0 l/min
Scan End	1800 m/z	Set Collision Cell RF	350.0 Vpp	Set Divert Valve	Waste



BRUKER MAXIS HRMS REPORT

School of Chemistry
University of Hyderabad

Analysis Info

Analysis Name D:\Data\2014\PROF.M.PERIASAMY\JUNE\PS.d
Method tune_low.m
Sample Name P5-CHCL3-ACN
Comment

Acquisition Date 6/5/2014 11:13:25 AM

Operator Ramu Sridhar
Instrument maXis 10138

Acquisition Parameter

Source Type	ESI	Ion Polarity	Positive	Set Nebulizer	4.4 psi
Focus	Not active	Set Capillary	4500 V	Set Dry Heater	200 °C
Scan Begin	50 m/z	Set End Plate Offset	-500 V	Set Dry Gas	4.0 l/min
Scan End	1800 m/z	Set Collision Cell RF	350.0 Vpp	Set Divert Valve	Waste

